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The purpose of this study was to investigate the effect of aural instruction with tonal and rhythm patterns from Edwin Gordon's Music Learning Theory on the tonal and rhythmic discrimination abilities of second-grade students. The secondary purpose of this study was to determine whether there was a relationship among the extent of music experience, preference for music activities, and the tonal and rhythmic discrimination abilities across four groups of second-grade students.

Participants were four intact second-grade general music classes from one elementary school in North Carolina. The classes were assigned randomly to three experimental groups and one control group. I instructed the experimental groups using Edwin Gordon's aural-based tonal patterns in Music Learning Theory for ten minutes each class period during a treatment week and rhythm patterns the next treatment week. The experimental groups were assigned randomly to one of three conditions: (a) playing instruments only, (b) singing and chanting only, and (c) singing, chanting, and playing instruments. The control group did not receive tonal and rhythm pattern instruction; instead, I instructed participants for ten minutes each class period using classroom activities from the *Spotlight on Music* second-grade textbook series. At the beginning of the study, all participants were administered the *Primary Measures of Music Audiation* (PMMA) to measure their developmental music aptitude. Participants were administered a researcher-created questionnaire to determine the extent of their musical experience and

their music activity preferences. Some students were selected at random to be interviewed by me to provide additional information about their questionnaire responses. At the end of the study, all participants were administered the PMMA as a posttest. The research study period was August 31 – December 16, 2015, with twelve weeks allotted for the instructional treatment period.

Using the pretest as the covariate, an ANCOVA was performed to determine whether there were any significant main effects or interaction effects of instruction. Results of the ANCOVA analyses indicated there were no significant main effects or interaction effects of instruction for any of the PMMA subtests at the .05 level of significance. Stepwise multiple regression analyses were conducted to determine whether there were significant relationships among the extent of music experience, preference for music activities, and the PMMA scores. Results indicated that preference for jazz and the genre labeled "other" (i.e., rap, hip-hop, and "Kidz Bop") were small, negative predictors for PMMA tonal scores. Preference for singing as a favorite music activity was a small, negative predictor for PMMA rhythm scores, and preference for the pop genre was a small, positive predictor for PMMA rhythm scores. Jazz genre preference was a small, negative predictor for PMMA composite scores, while pop genre preference was a small, positive predictor. The control group, as compared to the three experimental groups, was a small, positive predictor for PMMA rhythm scores only. Based on these results, aural instruction with tonal and rhythm patterns from Edwin Gordon's Music Learning Theory did not have a significant effect on the tonal and rhythmic discrimination abilities of second-grade students.

THE EFFECT OF AURAL INSTRUCTION WITH TONAL AND RHYTHM PATTERNS FROM EDWIN GORDON'S MUSIC LEARNING THEORY ON THE AURAL DISCRIMINATION ABILITIES OF SECOND-GRADE STUDENTS

by

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CHAPTER I

INTRODUCTION

Background of the Problem

Many students leave elementary school with basic music reading skills, but some may not have the aural skills necessary to have a comprehensive understanding of music. While students may be able to identify elements of written notation, they may lack the skills to discriminate melodic and rhythmic differences aurally. Instruction in the upper elementary music classroom and in many cases in the lower grades as well, is often focused on reading and writing music notation, with little instructional time spent on aural activities, such as music listening, playing by ear, and improvisation. According to the most recent music assessment data from the National Assessment of Educational Progress (NAEP), the overall music scores of students in grade 8 decreased significantly from 53% in 1997 to 51% in 2008 ($p < .05$; Keiper, Sandene, Persky, & Kuang, 2009). Most of the significant differences were observed for items related to aural tasks, such as identifying the pitch contour of a melody in a recording (from 63% in 1997 to 56% in 2008; $p < .05$), and identifying saxophone as the instrument playing the melody (from 66% in 1997 to 56% in 2008; $p < .05$; Keiper, Sandene, Persky, & Kuang, 2009). While the percentage of students in grade 8 who self-reported listening to music during music class activities at least once a month had no significant change (from 51% in 1997 to 49% in 2008; $p > .05$), there was a significant increase of students who reported writing down

music notation during music class activities (from 26% to 33%; $p < .05$; Keiper, Sandene, Persky, & Kuang, 2009).

Although these findings were for students in grade 8, the music instruction that students receive at the elementary level can provide the basis for the level of musical achievement and understanding as students progress through their education. Instruction focused on reading and writing notation without a foundation and balance of aural instruction, often results in music students who can read and play notes from notation, but without an internal understanding of their purpose and function (e.g., tonal and rhythmic function). This notion coincides with Edwin Gordon's belief that "music theory should be thought of as an outcome of musicianship" (Gordon, 1989b, p. 76). Although Lowell Mason, often referred to as "the father of music education," promoted a sound-before-symbol approach to music education beginning in the 1830s, music in the classroom today is often taught with a focus on written notation (Abeles, Hoffer, & Klotman, 1994, p. 11). The influence of more modern sound-before-sight approaches from pedagogues such as Shinichi Suzuki, Carl Orff, Zoltán Kodály, and Edwin Gordon, have shifted emphasis away from notation slightly, but aural instruction is still often overshadowed by written notation as a means of music pedagogy in many classrooms. As testing and accountability continue to gain importance in public schools, emphasis on a written product remains a powerful force since it can be measured readily. To provide a foundation for young students to develop aural discrimination skills fully, aural-based music instruction should be delivered consistently, especially in the early elementary years from Kindergarten through third grade.

Edwin Gordon recognized the need for music students to receive a foundation of aural instruction prior to written notation instruction. While pursuing a doctoral degree in music at the University of Iowa, he observed and taught music students in grades K – 12 at the University Laboratory Schools (Gordon, 2011). He discovered that "students did not have necessary informal and formal experiences and background to deal with music as a core subject" (Gordon, 2011, p. 16). Many of the students in these schools could not identify the tonic of a given song and many could not demonstrate the meter of a song. Gordon realized the need to research these problems and try to find solutions for better music instruction. These realizations eventually led to the creation of his Music Learning Theory, which is an explanation of how children learn music (Gordon, 1971b).

Gordon's Music Learning Theory is a sequential explanation of music learning that closely mirrors language acquisition. He indicated five hierarchical language vocabularies that occur when children learn their native language: listening, speaking, thinking/conversing, reading, and writing (Gordon, 2012). When children learn their native language, they spend a great deal of time listening to other people speak the language. Children are acculturated with the sounds of their native language before they begin to speak for themselves. When children start school in kindergarten, they have had years of listening and speaking opportunities to use as the foundation for learning how to read and write in their native language.

Gordon has indicated five hierarchical music vocabularies that follow the same language learning sequence: listening, performing, audiating (thinking and comprehending in music), reading, and writing (Gordon, 2012). When students begin

public school music instruction in kindergarten, they may not have had a great deal of music listening or performing experiences. Even if they have had musical experiences, those experiences may have been limited to a certain genre or style of music. Without the foundation of a variety of aural music experiences, students may have difficulty understanding or assigning meaning to music that is taught in school. Gordon stated:

> All learning begins with the ear, not the eye, and learning music, of course, is no exception. Because, however, an abundance of students enter school without necessary preparation to learn what a music teacher is attempting to teach, many teachers instantly feel defeated and depend on teaching through the eye (Gordon, 2012, p. 26).

When a foundation of aural experiences is provided for students, they are more prepared to understand the connection to written notation when it is introduced later on. However, if students are taught to read and write written notation before they understand how notation relates to sound, they may have deficiencies in their aural skills and a lack of comprehension about the functions of music.

Davidson, Scripp, and Welsh (1988) sought to understand why there is often a difference between "writing what we hear" and "writing what we know" (p. 70). In a study of over four hundred participants of different musical backgrounds ranging from children to adults, young children–not formally trained in music, between the ages of five to seven, were able to sing a familiar song and then effectively create their own music notation to represent it. The children in the study could explain their notation and demonstrate an understanding of how their notation related to the song. When a group of musically trained twelve-, fifteen-, and eighteen-year-olds were asked to perform the

same task, using the standard written notation with which they were familiar, over 90 percent of the notations were inaccurate, even though the participants sang the song correctly (Davidson, Scripp, & Welsh, 1988). Although this group had musical training, they did not have a clear understanding of the relationship between aural and written music. The authors posited, "the type of training students receive (whether strongly perceptual or conceptual in orientation) makes a significant difference in their ability to represent their musical knowledge accurately" (Davidson, Scripp, & Welsh, 1988, p. 65).

Reknowned French pedagogue Nadia Boulanger said,

> The ear is everything. We must give children tones, pitch recognition, as we give them the words of language or the symbols of mathematics. And we must begin early. . . In music, never is the ear training started early enough (Brown, 1982, p. 50).

The importance of developing aural skills has also been recognized by members of the College Music Society, whose manifesto calls for a progressive change in undergraduate music program design. The authors state that the recommendations for change are centered on the need for three core elements: "creativity, diversity, and integration" (Campbell, Myers, Sarath, Chattah, Higgins, Rudge, & Rice, 2014, p. 2). Within these core elements is the belief that "Aural musicianship needs to be emphasized as much as visual literacy" (Campbell et al., 2014, p. 36).

Music is first and foremost an aural art form. In many genres and cultures around the world, music is learned aurally and orally without ever being written down in formal notation. Many Western music educators and performers believe that aurally/orally

learned music is less important because the musicians do not read or write music notation. Conversely, many performers who have learned music through an oral tradition view written notation as a restriction to their musicality. Woody referenced an anecdote from jazz musician Louis Armstrong who, "[w]hen asked whether he could read music . . . is said to have replied, 'Yes, but not enough to hurt my playing'" (2012, p. 83). For a comprehensive understanding of music, a balance of aural and visual literacy is needed, with a foundation of aural experiences and learning preceding written instruction. Campbell, Scott-Kasner, and Kasner have stated, "Development of the ear is crucial to development of musicianship" (2014, p. 239). Just as with learning a language, when children receive a variety of aural experiences from infancy through elementary school, set in context to facilitate understanding, children can be better equipped to grow as musicians and music learners. The authors stated, "Older children are able to recognize and apply a wide range of concepts to music listening experiences, provided they have had a strong foundation in music education" (Campbell, Scott-Kasner, & Kasner, 2014, p. 240).

Most music educators would agree that providing students the opportunity to gain a comprehensive understanding of music would be a very beneficial instructional goal. There is no consensus on the best approach for this goal, but there is a clear need for a greater foundation of aural experiences in order to help students reach that goal. Since educators may be reluctant to change from a teaching method with which they feel comfortable, new aural experiences may be best added incrementally at first. In this study, my aim is to inform music education by investigating whether a short amount of

aural music pattern instruction, when added to an existing curriculum, has an effect on students' aural discrimination abilities.

Purpose of the Study

The purpose of this quasi-experimental study was to investigate the effect of aural instruction with tonal and rhythm patterns from Edwin Gordon's Music Learning Theory on the tonal and rhythmic discrimination abilities of second-grade students. Each intact second-grade class was assigned randomly to one of four groups: (a) no pattern instruction, (b) playing instruments only, (c) singing and chanting only, and (d) singing, chanting, and playing instruments. The dependent variables were the posttest scores on the *Primary Measures of Music Audiation* (PMMA) and the primary independent variable was the type of instruction. Primary research questions associated with the present study included:

1. Is there a significant main effect of aural instruction with Edwin Gordon's tonal and rhythm patterns in music learning theory on the tonal discrimination abilities across the four groups of second-grade students?
2. Is there a significant main effect of aural instruction with Edwin Gordon's tonal and rhythm patterns in music learning theory on the rhythmic discrimination abilities across the four groups of second-grade students?

The secondary purpose of this study was to determine whether there was a relationship among the extent of music experience, preference for music activities, and the tonal and rhythmic discrimination abilities across four groups of second-grade students. Secondary research questions associated with the present study included:

3. Is there a relationship among the extent of music experience, preference for music activities, and the tonal discrimination abilities across the four groups of second-grade students?
4. Is there a relationship among the extent of music experience, preference for music activities, and the rhythmic discrimination abilities across the four groups of second-grade students?
5. What are the preferences of second-grade students for music class activities and performances?

Limitations and Delimitations

Due to the lack of availability of local elementary music teachers certified in Music Learning Theory (MLT), I served as the instructor for this study. I obtained my Elementary General Music Level One certification from the Gordon Institute of Music Learning in July 2015. Lessons were video recorded and evaluated to check for teaching consistency across all groups. Three licensed music teachers certified in MLT were selected and trained by me to review and evaluate the recorded lessons.

This study used intact classes for assignment to the experimental and control groups, due to the standard arrangement of the elementary school system. As a function of my ease of access, this study featured students from a single elementary school.

Definition of Terms

Some of the following terms may be unfamiliar to those not acquainted with Edwin Gordon's language, or there may be different interpretations. Therefore, the following definitions are included to clarify their meanings as used in this study.

Audiation: The ability to assimilate and comprehend music in our minds that is not physically present. If music is the subject of communication, then performance is the vehicle and audiation is what is communicated (Gordon, 2012).

Aural Perception: The ability to hear sound when it is physically present (Gordon, 2012).

Developmental Music Aptitude: The developmental stage of music aptitude lasts from birth to approximately nine years of age. Environmental and educational factors can affect a child's music potential during this time (Gordon, 2012).

Learning Sequence Activities: These are activities that include skill learning sequence, tonal learning sequence, rhythm learning sequence, and pattern learning sequence (Gordon, 2012). Following the recommendations of Gordon (2012), no more than ten minutes per class period were devoted to learning sequence activities in the current study.

Macrobeats: The longest beats that are felt in a rhythm pattern. The macrobeats are the fundamental beats (Gordon, 2012).

Melodic Discrimination: The ability to detect differences between two melodic patterns.

Microbeats: The divisions of macrobeats (Gordon, 2012).

Music Aptitude: A measure of one's potential to learn music (Gordon, 2012).

Music Learning Theory (MLT): An explanation of how children learn music, created by Edwin Gordon (Gordon, 2012).

Rhythm Pattern: A combination of two or more durations in a particular meter that are audiated in a sequence (Gordon, 2012). Although some researchers have used the term "rhythmic pattern" to be more consistent with the term "rhythmic discrimination," I have retained the term "rhythm pattern" because that is the terminology that Gordon used throughout his writing.

Rhythm Syllables: Syllables that are chanted for different rhythmic durations in a pattern, based on beat functions (Gordon, 2012).

Rhythmic Discrimination: The ability to detect differences between two rhythm patterns.

Stabilized Music Aptitude: The stabilized music aptitude stage ranges from approximately nine years of age throughout adulthood. Environmental and educational factors do not significantly affect music potential during this time (Gordon, 2012).

Tonality: Refers to modes of music, not the name of a key signature. Tonality is defined by the resting tone, which is the tonal center. The modes that tonality refers to are: major, harmonic minor, Dorian, Phrygian, Lydian, Mixolydian, Aeolian, and Locrian (Gordon, 2012).

Tonal Pattern: A combination of two or more pitches in a particular tonality that are audiated in a sequence (Gordon, 2012).

Tonal Syllables: Syllables that are sung for different pitches in a tonal pattern, based on the movable-do system with a *la* based minor (Gordon, 2012).

CHAPTER II

RELATED LITERATURE

The purpose of this study was to investigate the effect of aural instruction with tonal and rhythm patterns from Edwin Gordon's Music Learning Theory on the tonal and rhythmic discrimination abilities of second-grade students. I organized this chapter to examine the following topics: (a) tonal and rhythm patterns, (b) tonal, melodic, and rhythmic aural discrimination, and (c) Music Learning Theory. Since tonal and rhythm patterns are the focus of the aural instruction in this study, literature related to music patterns are examined first. Second, literature related to tonal, melodic, and rhythmic aural discrimination are examined in regard to music perception and music preference. Finally, literature related to Gordon's Music Learning Theory are examined, as it provides the conceptual framework for this study. The main elements of Gordon's Music Learning Theory that served as the guide for the review of related literature include the tonal and rhythm patterns as related to Gordon's beliefs about music learning taxonomy, audiation, and music aptitude.

Tonal and Rhythm Patterns

Tonal and rhythm patterns may be thought of as fundamental building blocks in music. Edwin Gordon compared musical patterns to words in language, in that they both provide context to the larger construct (i.e., music or sentences; 2012). When children first learn their native language, they spend a great deal of time listening to the sounds

around them, and then begin to babble and experiment with words. As they learn more words and increase their speaking vocabularies, their fluency increases and they can think and converse in the language. It is only until they have had listening, speaking, and thinking/conversing experiences that children begin to read and write a language. Gordon believed that the process of learning music should follow the same sequence (e.g., listening, performing, audiating, reading, and writing; 2012). He indicated that children should have many music listening opportunities to experience a variety of music in various tonalities and meters. After a great deal of listening experiences, they can begin to sing and play music, first with tonal and rhythm patterns, which are similar to speaking words in a language (Gordon, 2012). Tonal and rhythm patterns help children build their musical vocabularies and increase their musical fluency.

Pattern instruction may be beneficial in fostering musical understanding through aural skills development. Campbell, Scott-Kasner, and Kasner (2014) suggested the inclusion of many varied listening experiences in the music classroom while fostering "*active listening*, in which the learner focuses on musical events such as patterns that repeat and contrast" (p. 240). When students become familiar with a variety of tonal and rhythm patterns that can be heard in pieces of music, they can become better listeners. Campbell suggested that as students listen to music attentively and repeatedly, "They can pick up particular phrases and patterns aurally, and they will do so with greater ease as they become familiar with the music" (2005, p. 33).

In a study of tonal pattern instruction, Grutzmacher (1987) sought to investigate the relationship between tonal pattern instruction using harmonization and vocalization to

tonal concept development and the performance achievement of beginning wind instrumentalists in fifth and sixth grades. The experimental group received aural instruction of researcher-designed tonal patterns through harmonization and vocalization. The control group did not receive aural tonal pattern instruction; instead, they were instructed using a set of musical symbols and a range of pitches taught from written notation (Grutzmacher, 1987). Participants were administered the *Musical Aptitude Profile* (MAP) *Tonal Imagery* as a pretest only, the *Iowa Tests of Musical Literacy* (ITML), *Level 2, Tonal Aural Perception* and *Tonal Reading Recognition* as pretest and posttest, and a researcher-created *Melodic Sight-Reading Achievement Test* (MSRAT) as posttest only.

Results from Grutzmacher's (1987) study indicated there was a significant difference ($p < .001$) between mean scores of the groups on the ITML *Tonal Aural Perception* test, with the experimental group achieving higher scores than did the control group. While analysis of the mean scores of the groups on the ITML *Tonal Reading Recognition* test indicated that differences between the groups were not significant ($p > .05$), the experimental group achieved higher scores than did the control group. The results of the posttest melodic sight-reading achievement test indicated that there was a significant difference ($p < .0001$) between the groups, with the experimental group scoring higher. Grutzmacher suggested that the aural tonal pattern method improved students' tonal aural perception and melodic sight-reading abilities more effectively than did the method using traditional written notation (1987). The results of this study indicate

that students' aural development may benefit from aural tonal pattern instruction, and provide a foundation for a comprehensive understanding of music.

Holahan, Saunders, and Goldberg (2000) sought to determine whether there was any difference in tonal cognition of pattern discrimination among college–aged musicians, college–aged non-musicians, and first-grade general music students. Researcher-created tonal tests were administered to the participants and results indicated that the college–aged musicians' scores were significantly higher than were scores for both other groups' scores ($p < .05$). While three tonal tests were administered to the college–aged participants, only one tonal test was administered to the first-grade students. When comparing the groups' accuracy scores on the common test, results indicated that the observed mean for the musician group was higher compared to the other groups. The observed mean for the first-grade group was only slightly lower than the non-musician college group. Since the first-grade scores and the non-musician college scores were so similar, the researchers suggested that "the cognitive load of relatively simple three-tone patterns that differ in only one pitch can be demanding even in adults who have little musical experience" (Holahan, Saunders, & Goldberg, 2000, p. 174). These results illustrate the need for early musical experiences in order to foster aural discrimination skills.

The effects of visual and aural modes of presentation on the ability to perform rhythmic patterns were investigated by Shehan (1987), in relation to the development of music literacy. The participants in the study were second-grade ($n = 25$) and sixth-grade ($n = 24$) students enrolled in a suburban school. Four researcher-designed rhythmic

patterns were presented in four modes: (a) audio-rhythm, (b) audio-mnemonics, (c) (audio) visual-rhythm, and (d) (audio) visual-mnemonics. After each rhythmic presentation, the participants were asked to memorize and then perform the rhythm pattern on a woodblock. Frequencies of the number of trials needed to obtain a correct pattern for each condition were collected from each participant group. A four-way ANOVA with repeated measures was used to analyze the data. Modes of presentation and grade level were significantly different ($p < .05$), and a Neuman-Keuls multiple comparison indicated differences among the means of the presentation modes (Shehan, 1987). For both grade levels, more trials were necessary in learning the rhythm patterns through aural modes than the patterns that incorporated visual presentations. The number of trials needed for second-grade students to obtain a correct pattern was much higher than the number of trials needed for sixth-grade students across all modes of presentation. The results of this study indicated that listening to a rhythmic pattern while viewing a visual representation of the notation or mnemonic yielded the greatest success for students in both grade levels. The implications of this study are that both aural and visual music instruction in the schools are important to improve the music literacy and aural skills development of students. A sequential music curriculum that features sound-before-sight instruction would greatly benefit students' musical development.

Summary

The results of these studies on the impact of tonal and rhythm pattern instruction on aural development suggest that tonal and rhythm patterns can be beneficial for aural skills development. Specifically, tonal pattern instruction may improve tonal perception

and melodic sight-reading skills of students, and aural instruction may be more effective when appropriate contexts are provided to aid memory. The results of these studies indicate the need and importance of music pattern instruction, especially in the early years of a students' music education, to aid in aural skills development.

Tonal, Melodic, and Rhythmic Aural Discrimination

As sound travels through the air, the sound waves are processed aurally and cognitively to allow us to perceive the sound. "Human perception of sound involves subjective interpretations that can be influenced by factors such as past experiences or present circumstances" (Hodges & Sebald, 2011, p. 112). Factors such as musical education, musical training, genetics, experiences, or environment, may affect how we perceive sound.

In a study investigating the tonal awareness of first- through sixth-grade music students, Norris (2013) created a measurement instrument called the *Tonal Dissonance Detection Test* (TDDT) to determine whether students could identify dissonance in a short tune. Participants (N = 312) were students in grades 1 – 6 at an elementary school, in which music classes for the participants were instructed by the same music teacher. If students heard the presence of a wrong note in the tune, they selected a sad face; if they thought the tune sounded "right," they selected a happy face (Norris, 2013). Results indicated that students in each grade level achieved higher scores than did the students in the grade level immediately below them. There was a significant difference between the mean scores of second- and third-grade students ($p < .001$). A Tukey's post hoc analysis revealed two homogeneous subsets: (a) grades 1 and 2 and (b) grades 3, 4, 5, and 6.

Norris suggested that the increase in scores between second- and third-grade students, and the homogeneous score grouping of the upper grade students supported Edwin Gordon's idea that music aptitude stabilizes around age nine (Norris, 2013). Students in American public schools typically reach age nine during the third grade school year, so the homogeneous grouping of scores in grades 3 – 6 would seem to support the notion of stabilized aptitude.

Lucas and Gromko (2007) investigated the relationship between aural music pattern discrimination ability and phonemic awareness, which is the ability to hear and manipulate individual sounds in words. Participants (N = 27) were first-grade students in a rural elementary school. The *Dynamic Indicators of Basic Early Literacy Skills* (DIBELS) test was administered, which consists of aural and visual subtests. The phoneme segmentation fluency (PSF) subtest is an aural test that requires students to verbally segment a word into its phonemes after students hear the word. The nonsense word fluency (NWF) is a visual subtest that requires students to sound out short nonsense words that are shown to them visually. Participants were administered the tonal and rhythm subtests of the *Primary Measures of Music Audiation* (PMMA) to determine their musical pattern discrimination skills. There was a moderate, positive correlation between the PMMA composite scores and the DIBELS PSF scores, $r = 0.49$ ($p = .01$), between the tonal subtest of the PMMA and the DIBELS PSF, $r = 0.39$ ($p < .05$), and between the rhythm subtest of the PMMA and the DIBELS PSF, $r = 0.41$ ($p < .05$). The authors suggest that the reason for the correlation between music discrimination skills and phoneme segmentation fluency is that they "both require aural perception ability" (Lucas

& Gromko, 2007, p. 15). The results of this study suggest a positive relationship between aural language development and aural music development, which supports the theory posited by Edwin Gordon.

The ability to perceive and discriminate sounds can be influenced by musical training in children as well as adults (Gromko & Walters, 1999; Jordan-DeCarbo, 1989; Kishon-Rabin, Amir, Vexler, & Zaltz, 2001). This idea was the premise of a study conducted by Morrongiello, Roes, and Donnelly (1989) to determine whether musical training could affect children's perceptions of frequencies, intervals, and contour in unfamiliar melodies. Participants (N = 80) were children ages 4 – 6, divided into two groups: musically trained (n = 40) and musically untrained (n = 40). The musically trained group spent at least six months in an instrumental training program prior to the beginning of the study, while the musically untrained group had not received any formal music training. Participants from each group were divided randomly into four groups and administered a researcher-created melodic discrimination test. The test contained a total of 30 melodies, with each melody consisting of six tones. Each group had a different presentation mode, which varied in the speed at which the melodies were played: (a) 1.5 tones/second, (b) 2.5 tones/second, (c) 4.5 tones/second, (d) 5.5 tones/second. Participants indicated by raising or clapping their hands when they recognized a change in the melody.

Using a three-factor repeated measures analysis of variance (ANOVA), Morrongiello, Roes, and Donnelly (1989) found that the musically trained group performed significantly better than did the musically untrained group overall ($p < .001$).

A Newman-Keuls post-hoc analysis indicated that all but one category of transformation was significant between both groups ($p < .01$). When a melody was presented with all three violations (frequency, interval, and contour), there was no significant group difference ($p > .05$); both groups discriminated the change at a comparable rate. The fast presentation rates had the overall lowest performance scores for the musically untrained participants, while the different presentation rates had little effect on the musically trained participants. These results indicate that musical training may benefit children's ability to process musical features. The implications for this study are that musical training is important for children, especially in the early years of development, and with a rich foundation of musical experiences, children's abilities to discriminate music may increase.

The extent and variety of aural musical experiences that children encounter early in life may affect their aural discrimination abilities. May (1985) sought to determine the music preferences of first-, second-, and third-grade students and investigate whether those preferences had an effect on their aural discrimination abilities. The participants in the study ($N = 577$) were first- ($n = 183$), second- ($n = 199$), and third-grade ($n = 195$) students from three elementary schools in Kansas, Texas, and Mississippi. The *Primary Measures of Music Audiation* (PMMA) was administered to all participants to measure their tonal and rhythm discrimination skills. The Music Preference Reaction Index (MPRI), a researcher-created test, was administered to all participants to measure the participants' musical style preferences. The test used 26 aural music excerpts from different genres for participants to listen to and choose their preference based on a 5-point

Likert-type scale featuring cartoon faces with a range of pleasant emotions. The overall means from the MPRI indicated that "rock, easy listening pop, children's music, and country and western were generally liked, while art and jazz styles generally were disliked by the total group" (May, 1985, p. 12).

Using an ANOVA, May (1985) found that there was an overall decline in preference with each higher grade level, especially between the first and second grades. Canonical correlation analyses indicated a significant small, positive relationship ($p <$ .01) between the PMMA and the MPRI (May, 1985). May concluded tentatively that "preference for highly melodic excerpts might be related to tonal discrimination skill, while preferences for highly rhythmic excerpts might be related to rhythmic discrimination skill" (1985, p. 19). The implications of these results indicate that children's musical preferences begin to narrow very early on, even in first and second grades. A variety of aural music experiences should be given to students early in their music education in order to provide many different listening experiences. The results of this study indicated a small but positive relationship between musical preferences and aural discrimination skills, which suggests that a greater variety of aural experiences may benefit students' aural discrimination skills.

Summary

The findings of the previous studies suggest that instruction, music experience, and music preference may influence aural discrimination abilities. The ability to discriminate tonal dissonance aurally may increase with age, which indicates that either music instruction or informal music experiences can influence aural skills development.

Phonemic awareness and aural discrimination skills may be positively related, which supports Edwin Gordon's theory that the music learning process is similar to language acquisition. Musical training may improve aural discrimination skills, as compared to those without musical training, which supports the importance of early and continued musical experiences. Music preferences may be positively related to aural discrimination skills, in that the extent and variety of aural music experiences may affect the development of students' aural skills. These studies indicate the need for aural music experiences early in a child's musical development in order to increase musical awareness and foster aural musicianship.

Music Learning Theory

Edwin Gordon's Music Learning Theory is an explanation of how children learn music, which involves a sequential and hierarchical process centered around the ability to audiate music (hear and comprehend music in the mind). Through the use of tonal and rhythm patterns, students develop an understanding of music in context similar to the process of learning how words fit together to make sentences. Music aptitude tests can allow teachers to differentiate instruction based on music aptitude scores. Gordon indicated there are two levels of music aptitude: developmental and stabilized. Developmental aptitude can be influenced by environment, instruction, and experiences until aptitude is stabilized around age nine (Gordon, 2012).

Gordon's Music Learning Theory is comprised of two types of learning: discrimination and inference. Discrimination learning occurs when students "are conscious of being taught but do not fully understand what or why they are being taught"

(Gordon, 2012, p. 95). During this part of the learning process, the teacher provides students with the answer, as they learn through imitation and modeling. The five levels of discrimination learning are: (a) the teacher helps students learn to listen to and imitate patterns first (aural/oral), (b) students associate those patterns with verbal labels (verbal association), (c) students synthesize what has been learned in order to develop a sense of context with the music (partial synthesis), (d) students read and write music notation for familiar patterns (symbolic association), and (e) students bring an understanding of tonality and meter to the reading and writing of familiar patterns (composite synthesis; Gordon, 2012). Inference learning occurs when students are "teaching themselves to learn what is unfamiliar by inferring from what is familiar" (Gordon, 2012, p. 95). During this stage of learning, the teacher is more of a guide. The three levels of inference learning are: (a) students transfer what they know to unfamiliar patterns (generalization), (b) use improvisation and composition to help develop their understanding (creativity/improvisation), and (c) students learn a theoretical understanding of music to explain the 'whys' of music, such as the elements of traditional music theory (theoretical understanding; Gordon, 2012). While Music Learning Theory is a theory and not a method, it does provide a systematic approach to how children learn music.

Music Patterns

Music patterns are an essential part of Gordon's Music Learning Theory and his taxonomy of tonal and rhythm patterns is extensive and established. Although many have examined music pattern difficulty levels and hierarchies (e.g., Bradford, 1995; Holahan & Saunders, 1997; Jones, 1979; Wolf, 2005), Edwin Gordon's pattern research is often

the most noted due to the extent and breadth of his research (Gordon, 1974, 1976, 1978; O'Donnell, 2011; Wolf, 2004). The importance of music pattern instruction comes from Gordon's theory of how children learn music, in that the learning process is similar to how children learn language. Gordon stated, "We learn to speak words, not letters, and we learn to perform tonal patterns (and rhythm patterns), not individual pitches and durations" (2011, p.10).

Shuler (1991) investigated the effects of using Gordon's music patterns in learning sequence activities on music achievement with six intact classes of third grade general music students in Rochester, New York. Three classrooms served as the experimental group and three classrooms served as the control group. Two music teachers served as the instructors for this study; one teacher taught two experimental classes and one control class, and one teacher taught one experimental class and two control classes. The treatment period lasted for seven months, from September to April, and the classes met twice each week. In the experimental groups, students were instructed with aural tonal and rhythm patterns from Edwin Gordon's *Jump Right In* series for 25 percent of the class time. The remainder of each class time was spent engaging in classroom activities. In the control groups, students did not receive tonal and rhythm pattern instruction; instead, they engaged in classroom activities for the entire class time. The *Intermediate Measures of Music Audiation* (IMMA) was administered to all subjects as a pretest. A researcher-created vocal performance achievement measure containing five rhythm and five tonal criteria was administered to all subjects as a posttest. Among students taught by Teacher 1, the mean performance posttest score of the control groups was significantly

higher than was that of the experimental group ($p < .05$). Among those taught by Teacher 2, the mean of the control group was significantly lower than was that of the experimental groups ($p < .05$). The difference of scores between the groups taught by the two teachers in the study suggested that the effectiveness of teacher instruction greatly affected students' achievement.

McDonald (1991) developed a method for elementary recorder instruction based on Gordon's model of learning and compared the effectiveness of this method with a traditional method that emphasized written notation. The participants in the study were third grade general music students ($N = 27$), who were divided into an experimental group ($n = 13$) and a control group ($n = 14$). The experimental group received recorder instruction from the researcher based on Gordon's five skill levels of discrimination learning, which included playing and singing the song by rote before viewing the notation and singing and chanting tonal and rhythm patterns. The control group received recorder instruction from the researcher using a traditional recorder method book that used written notation. All participants were administered the *Primary Measures of Music Audiation* (PMMA) during the first week of the study. After a twelve-week instruction period of four, fifteen-minute lessons per week, participants were administered the same test in addition to a researcher-created recorder performance test.

Using a t-test, McDonald (1991) found that the rhythm and composite scores of the PMMA were significantly higher for the experimental group than were those for the control group ($p < .05$). The mean tonal scores were higher for the experimental group, but the difference was not significant ($p > .05$). The experimental group scored

significantly higher than did the control group ($p < .05$) on the *t* test for the recorder performance scores, on each dimension of the performance achievement test (melodic, rhythmic, and executive skills) and on the composite score. Although the sample was very small and the participants were in an intact class, the results are very interesting and suggest that Edwin Gordon's model of learning sequence could be an effective approach in teaching recorder in elementary music classes. The sound-before-sight method of teaching could be a way of developing greater musicianship in elementary students who are learning to play the recorder.

O'Donnell (2011) investigated Gordon's Music Learning Theory tonal and rhythm patterns with secondary music students ($N = 73$) to determine whether pattern instruction had an effect on the aural discrimination abilities of students in grades 8 – 12. The experimental group ($n = 38$) received pattern instruction with Gordon's Music Learning Theory tonal and rhythm patterns. The control group ($n = 35$) participated in sight-singing and rhythmic syllable activities. During the 14-week study, both groups received instruction from the researcher twice a week for five minutes each session. The *Advanced Measures of Music Audiation* (AMMA) was administered to all participants as a pretest and as a posttest. A comparison of pretest and posttest means of the AMMA indicated a slight gain from the pretest to the posttest with the experimental group, while the control group had a slight decrease in mean scores. A Multivariate Analysis of Covariance (MANCOVA) was performed to determine whether any significant main effects occurred between the two groups, as well as gender and involvement in private lessons. Results indicated there were no significant main effects ($p > .05$), although there

was a significant interaction between involvement in private lessons and group ($p < .04$; O'Donnell, 2011). This interaction indicated that across all groups, students who were involved in private lessons achieved the highest gains from the pretest to the posttest. Instruction with Gordon's Music Learning Theory patterns increased mean scores slightly, though not significantly, while students who took private lessons outside of school made the highest mean gains. Results of this study suggest that additional music instruction outside of school, combined with music pattern instruction in the classroom, may enhance students' aural discrimination abilities.

Audiation

The idea of *audiation* was created by Edwin Gordon in conjunction with his Music Learning Theory. Audiation is the hearing and comprehension of music in the mind (Gordon, 2012). Unlike imitation or memorization, audiation is an internalization of musical sounds that you have either heard in the past, have just listened to, or that you create. The audiation of music is similar to the thinking process in language (Gordon, 2012). It involves a sense of tonal and rhythm syntax, based on previous musical experiences. The ability to think about, contextualize, and make predictions about the music are important parts of audiation. During the six stages of audiation, (a) music patterns are momentarily retained in memory, (b) tonal and rhythm patterns are imitated and audiated, and tonal centers and macrobeats are identified, (c) objective or subjective tonality and meter is established and contextualized, (d) tonal and rhythm patterns that have already been learned are consciously retained, (e) tonal and rhythm patterns are recalled in unfamiliar music, (f) predictions of patterns are made based on previous music

experiences (Gordon, 2012). This process leads to the ability to internalize and understand music.

In a study examining the relationship between music aptitudes of students of diverse ethnicities, Gouzouasis (1993) found differences among students regarding tonal audiation ability. Participants (N = 281) were students five years of age from diverse ethnic backgrounds in Vancouver, Canada: Chinese (n = 91), East Indian [Sikh] (n = 71), Western European (n = 114). Participants were administered the tonal and rhythm subtests of the *Primary Measures of Music Audiation* (PMMA) to measure their developmental music aptitude. Mean tonal aptitude scores of the Western European and Chinese participants were higher than were the East Indian participants. There were no significant differences between mean scores of the rhythm subtest scores across the three groups ($p > .05$), although Western European and Chinese participants achieved higher rhythm aptitude scores than did the East Indian participants. Gouzouasis suggested that prior music experiences influenced the higher tonal scores of the participants of Western European and Chinese ethnicities (1993). The author also indicated that Western European, Chinese, and East Indian music are not as rhythmically different as they are tonally different, which may have accounted for the nonsignificant mean scores on the rhythm test (Gouzouasis, 1993). Gouzouasis suggested that the PMMA tonal score differences among the three groups may have been the result of the type of tonal patterns included on the test, as those patterns are founded in the Western music system and may have been difficult for those participants more familiar with non-Western music systems (1993). Results of this study suggest the importance of providing students a wide variety

of musical experiences from different tonalities and meters. Students may benefit from increasing their familiarity with various types of music to improve their ability to compare and contrast music and music patterns.

Azzara (1993) investigated audiation-based improvisation techniques on the music reading skills of elementary instrumental students. Since audiation is similar to thinking in language, the act of musical improvisation is related to spontaneous speaking in language (Azzara, 1993). Azzara stated, "Learning to improvise is a demonstration of acquired music thinking skills" (1993, p. 331). The participants in the study ($N = 66$) were fifth-grade wind and percussion students from two elementary schools. Participants were administered the *Music Aptitude Profile* (MAP) to measure their aptitude, and were asked to perform three researcher-created etudes to measure their music reading achievement. Participants in School A ($n = 45$) and School B ($n = 21$) were assigned randomly to one experimental and one control group within each school. All participants received 27 weeks of instruction for 30 minutes each lesson. Both the experimental and control groups received instruction from Gordon's *Jump Right In: The Instrumental Series*, which is based on Music Learning Theory. The experimental groups received audiation-based improvisation instruction and participated in researcher-created improvisation activities for 10 – 15 minutes of each lesson. At the end of the treatment period, all participants performed the etudes again. A Two-Way Analysis of Variance (ANOVA) indicated there was a significant main effect for type of instruction and music aptitude ($p < .05$). The experimental group received higher mean scores than the control group on the posttest etude scores. Participants who had high aptitude scores on the MAP

received a higher mean score than those who had moderate aptitude scores, although participants with low aptitude scores had a higher mean score than those with moderate aptitude scores. The results of this study indicate that audiation-based improvisation activities may improve instrumental students' music reading and performance abilities. Azzara stated,

> When improvisation was included as a part of elementary instrumental music instruction, students were provided with opportunities to develop an increased understanding of harmonic progression through the mental practice and physical performance of tonal and rhythm patterns with purpose and meaning (1993, p. 339).

In an investigation of the relationship between creativity and audiation ability, Kratus (1994) found several links between the ways in which third-grade students compose music and their level of audiation ability. Participants ($N = 40$) were third-grade students in three intact classrooms, all nine years old with none to less than one year of private piano instruction, in an elementary school in Ohio. All participants were administered the tonal and rhythm subtests of the *Intermediate Measures of Music Audiation* (IMMA). In order to evaluate their compositional process and product, participants were asked to compose a short song using an electric keyboard. They were given compositional parameters and a ten-minute time limit in which to compose the song. Four music educators evaluated and rated the processes and products of the participants.

Kratus (1994) found moderate, positive relationships between IMMA scores and participants' use of developing musical material, $r = .36$ ($p < .05$), and silence during the

composition process, $r = .33$ ($p < .05$). Kratus stated, "It could be that one's ability to audiate is an indication of one's sense of tonality and meter, and it is this tonal and metric sense that provides a structure in which to compose coherently" (1994, p. 126). The use of developing material in the compositional process involves the use of similar but not repetitive patterns. Conversely, there was a moderate, negative relationship between IMMA scores and the use of exploration in the composition process, $r = -.46$ ($p < .01$). The author suggested that these results may indicate that a greater ability to think in musical sound allows for less time spent exploring for the sounds intended for a composition (Kratus, 1994). Several of the composition characteristics were moderately correlated to the IMMA scores: (a) tonal cohesiveness (how well the piece relates to the tonal center; $r = .45$; $p < .01$), (b) metric cohesiveness (features regular beats; $r = .39$; $p < .05$), and (c) use of developed rhythmic pattern (uses similar but not repetitive patterns; $r = .39$; $p < .05$). There was a moderate, negative relationship between IMMA scores and pitch range, $r = -.36$ ($p < .05$). Based on these composition characteristics results, Kratus indicated that "those subjects with less ability to audiate tended to compose songs that were less restricted by musical considerations of tonality, meter, or range" (1994, p. 127). This study suggests that there may be positive and negative relationships between audiation ability and characteristics of creativity, but further research is needed for a better understanding of those relationships.

Music Aptitude

Tests of musical ability have existed in some form since the early 20th century. Most of these assessments measure musical ability through specific skills, such as

determining the difference between two rhythm patterns or two tonal pitches (Ullén, Mosing, Holm, Eriksson, & Madison, 2014). Music aptitude tests measure musical ability and the potential to achieve in music, whereas music achievement tests measure what one has learned about music. Most music aptitude tests present the listener with a pair of melodic or rhythmic patterns or sounds aurally, and then the listener must determine whether the pair are the same or different.

The most prolific creator of aptitude tests has been Edwin Gordon. He created tests of varying difficulties suitable for different age groups. Edwin Gordon's research indicates that music aptitude stabilizes around age nine, which typically occurs in the latter half of third grade. Prior to age nine, music aptitude is in the developmental stage and can be influenced by a child's education and experiences (Gordon, 2012). The *Musical Aptitude Profile* (1965), designed for participants in fifth through twelfth grade, consists of seven tests: tonal imagery (melody and harmony), rhythm imagery (tempo and meter), and musical sensitivity (phrasing, balance, and style). The *Primary Measures of Music Audiation* (1979), designed for subjects in Kindergarten through third grade, consists of two tests: tonal and rhythm. This test measures the developing aptitude of young participants. The *Intermediate Measures of Music Audiation* (1982) consists of two tests: tonal and rhythm. These tests are designed for subjects in first through sixth grade. It serves as a measure of developmental music aptitude for subjects in first through third grade, and as a measure of stabilized music aptitude for subjects in fourth through sixth grade. The *Advanced Measures of Music Audiation* (1989a) consists of one test that

combines tonal and rhythm measurements. This test is designed for advanced subjects in seventh grade through adulthood.

Based on the percentile rank of students' music aptitude scores, teachers differentiate pattern instruction based on aptitude level: low, average, and high (Gordon, 1986). Pattern instruction using Music Learning Theory, called "learning sequence activities," contains three levels of audiation pattern difficulty: easy, moderately difficult, and difficult (Gordon, 2001). During learning sequence activities, all students are instructed with the easy patterns, since everyone has some level of music aptitude. Students who have average music aptitude are also instructed with the moderately difficult patterns, and students who have high music aptitude are given all three levels. If a student with low music aptitude masters the easy pattern well, the teacher will also challenge him/her with a moderately difficult pattern. The same idea is true for students with average music aptitudes. By determining a student's music aptitude, the teacher can instruct students at their appropriate level and challenge them to an encouraging, but not frustrating point.

In a study comparing the effectiveness of large group and small group singing activities on the developmental music aptitudes of kindergarteners, Rutkowski (1996) sought to determine the relationship between singing achievement and aptitude. Participants (N = 99) were kindergarten students from one Pennsylvanian elementary school. Intact classes were assigned to either the experimental group (n = 50) or the control group (n = 49). All groups received large group music instruction including large group singing, music activities, movements, and games for 30 minutes once a week.

Small group and individual singing activities were included for the experimental group, but not for the control group. During the nine-month treatment period, all participants were administered the tonal subtest of the *Primary Measures of Music Audiation* (PMMA) as a pretest, midtest, and posttest. Participants were administered the researcher-created *Singing Voice Development Measure* (SVDM) as a pretest and a posttest to measure singing achievement.

In Rutkowski's (1996) study, both the experimental and control groups' mean PMMA scores increased over the course of treatment and there were no significant differences between the groups ($p > .05$). Rutkowski reported that an earlier pilot study resulted in higher posttest PMMA scores for the experimental group than the control group. However, the pilot study differed from the main study in that the pilot study featured two 30-minute class periods, with 15-minute segments taught by different instructors. These results suggest that teacher effect or length of instruction may have influenced the outcomes of the studies (Rutowski, 1996). The relationship between the SVDM and the PMMA was small but positive in the main study, with the strongest relationship reported between the posttests ($r = .207$). Due to this low relationship Rutkowski concluded that teachers should "not assume that a child's singing performance is an indication of his or her tonal potential for learning music" (1996, p. 363). Although no significant differences were found between the groups on the PMMA scores, both groups' mean scores increased over the course of the study. These results suggest that both large group and small group music instruction may have a positive effect on music aptitude scores.

Hornbach and Taggart (2005) investigated the nature of the relationship between developmental tonal aptitude and singing achievement among kindergarten, first-, second-, and third-grade general music students. They also sought to determine whether the relationship between music aptitude and music achievement changes with age (grade level), and to determine whether school setting or age (grade level) affects singing achievement. Participants (N = 162) were randomly selected kindergarten through third grade general music students of two elementary public schools from separate districts in Michigan. In the spring semester of the academic year, all participants were administered the tonal subtest of the *Primary Measures of Music Audiation* (PMMA) to measure tonal developmental aptitude. They were also administered a researcher-created test of singing achievement, in which they were rated on their singing performance of a previously taught song, "Bow Belinda." Performances were videotaped and rated by the researchers and an independent judge, using a researcher-created rating scale.

Using Pearson's r, Hornbach and Taggart (2005) found that coefficients for composite singing achievement scores and developmental tonal aptitude scores were low and nonsignificant, regardless of grade level ($p > .05$). A two-way Analysis of Variance (ANOVA) indicated that there were significant main effects for school setting ($p < .05$) and grade level ($p < .05$). Participants in School 2 scored significantly higher than did participants in School 1, regardless of grade level ($p < .05$). Fisher's PSLD indicated that second-grade students performed significantly better than did those in first grade and kindergarten ($p < .05$), and third-grade students performed significantly better than did kindergarteners ($p < .05$). The means for tonal aptitude did not change much from second

to third grade for one group, and remained almost the same for the other group. Edwin Gordon has indicated that music aptitude stabilizes around age nine, which typically occurs during the third-grade year or the beginning of the fourth-grade year (2012). Since testing occurred in the spring of the academic year and many of the third-grade students could have already reached age nine, these results support Gordon's assertion of music aptitude stabilization.

Summary

The results of the previous studies suggest that Gordon's Music Learning Theory patterns and the process of audiation may influence aural skills and musicality. Research also suggests that developmental music aptitude can be changed through music instruction or musical experiences. Gordon's Music Learning Theory process may be beneficial in a variety of settings, including general and instrumental music at the elementary and secondary levels. Instruction with Gordon's tonal and rhythm patterns may be more effective when combined with additional music lessons outside of school. When studies involve instruction with students, issues of teacher instruction differences may cause a confounding effect on the students' achievement scores and yield conflicting results (e.g., Shuler, 1991). Studies such as this indicate the importance of controlling for teacher bias so that research results can be interpreted accurately. Audiation, which is thinking and comprehending in musical sound, may be a beneficial process for the development of creativity and musicality. The previous studies also indicate that music experience can influence tonal audiation ability and developmental music aptitude. Additionally, results of the previous studies support Edwin Gordon's indication that

developmental music aptitude can be influenced by environment and musical experiences until it stabilizes around age nine. These studies indicate that music pattern instruction may be very beneficial in early music education when students are developing critical aural skills, and that pattern instruction can be a positive tool in many musical settings.

Conclusion

The research presented in this literature review illustrates the framework for the current study and supports the need for further research in the topic areas. Tonal and rhythm pattern instruction can influence aural discrimination skills, especially in the early years of music education. Tonal, melodic, and rhythmic aural discrimination skills can be affected by music instruction, musical experiences, and music preferences. A foundation of aural experiences and aural instruction may be beneficial to foster aural skills and help develop musicianship. Research involving aspects of Gordon's Music Learning Theory suggest that the use of his tonal and rhythm patterns may benefit students' aural skills development, especially in the early years of students' music education. Audiation research indicates that the process may aid in developing greater music comprehension and musicality. Research studies of music aptitude suggest that music instruction and musical experiences can influence music aptitude while in the developmental stage, which indicates that early musical experiences and instruction are crucial to the development of a student's musical education.

Many researchers have investigated the effect of singing and chanting with Edwin Gordon's tonal and rhythm patterns (i.e., Colley, 1987; O'Donnell, 2011; Palmer, 1976; Shuler, 1991; Stockton, 1982), and many studies have been conducted examining

instrumental instruction with the use of Gordon's patterns and the sequential process of Music Learning Theory (i.e., Azzara, 1993; Gamble, 1989; Gouzouasis, 1990, Kitts, 1993; McDonald, 1991). However, the research literature lacks an investigation of vocal and instrumental presentation modes of Edwin Gordon's tonal and rhythm patterns. As several researchers have indicated (Bowles, 1998; Broquist, 1961; Murphy & Brown, 1986; Nolin, 1973), many elementary students have more positive attitudes towards playing instruments than singing in music class. The current study seeks to add to this body of literature in an effort to inform music education on the use of tonal and rhythm pattern instruction through different presentation modes.

Research Questions

Primary research questions associated with the present study included:

1. Is there a significant main effect of aural instruction with Edwin Gordon's tonal and rhythm patterns in music learning theory on the tonal discrimination abilities across the four groups of second-grade students?
2. Is there a significant main effect of aural instruction with Edwin Gordon's tonal and rhythm patterns in music learning theory on the rhythmic discrimination abilities across the four groups of second-grade students?

Secondary research questions associated with the present study included:

3. Is there a relationship among the extent of music experience, preference for music activities, and the tonal discrimination abilities across the four groups of second-grade students?

4. Is there a relationship among the extent of music experience, preference for music activities, and the rhythmic discrimination abilities across the four groups of second-grade students?
5. What are the preferences of second-grade students for music class activities and performances?

CHAPTER III

PROCEDURES

Restatement of the Purpose

The primary purpose of this quasi-experimental study was to investigate the effect of aural instruction with tonal and rhythm patterns from Edwin Gordon's Music Learning Theory on the tonal and rhythmic discrimination abilities across four groups of second-grade students. Each intact second-grade class was assigned randomly to one of four groups: (a) Group A: no pattern instruction (control group), (b) Group B: pattern instruction using instruments only, (c) Group C: pattern instruction using singing and chanting only, and (d) Group D: pattern instruction using singing, chanting, and playing instruments. The dependent variables were the posttest scores on the *Primary Measures of Music Audiation* (PMMA) and the primary independent variable was the type of instruction. The secondary purpose of this study was to determine whether there was a relationship among the extent of music experience, preference for music activities, and the tonal and rhythmic discrimination abilities across four groups of second-grade students. The dependent variables were the posttest scores on the PMMA and the secondary independent variables were data from a researcher-created Music Experience/Music Activity Preference questionnaire.

Participants

This study involved four intact classes of second-grade general music students from one elementary school in North Carolina. After receiving approval by the Institutional Review Board at The University of North Carolina at Greensboro (see Appendix H), approval to conduct research was granted by Winston-Salem/Forsyth County Schools (WS/FCS) in North Carolina (see Appendix I). Parents of students in the four randomly chosen second-grade classes were sent a recruitment letter explaining the study and a parental consent for a minor form. While all the prospective participants in the study were native or fluent English speakers, some of the students' parents were native Spanish speakers. The letters and consent forms were translated to Spanish and sent to parents whose primary language was Spanish. Students who returned signed consent forms indicating permission from parents to take part in the study were given a minor assent form, which allowed participants to formally agree to participate.

The North Carolina elementary school in which this study took place was a K – 5, suburban, Title I school with a traditional school calendar. A Title I school has a percentage of students receiving free or reduced lunch that is equal to or greater than that of the school district (40% in the WS/FCS district; WS/FCS, 2015a). There were a total of 839 students enrolled at the elementary school in 2015 (WS/FCS, 2015b). The second-grade level of the elementary school had a total of 149 students enrolled in 2015 (WS/FCS, 2015b). As seen in the school demographics table below (see Table 1), the ethnicities of the students in the elementary school were categorized as Asian (1%),

Black or African American (18%), Hispanic (47%), Multi (3%), and White (31%; WS/FCS, 2015c).

Table 1

K – 5 School Demographic Information

Gender	n	%
Male	430	51%
Female	409	49%

Ethnicity	n	%
Asian	6	1%
Black or African American	153	18%
Hispanic	392	47%
American Indian/Alaskan Native	0	0%
Multi	28	3%
Native Hawaiian/Pacific	0	0%
White	260	31%

The classes were assigned randomly to three experimental groups and one control group. The participants attended the same school and they had received similar music training and experiences. The second-grade level was chosen for this study because previous research has indicated that seven and eight years of age may be an optimal period of music ability development (Gardner, 1994; Glover, 2000; Gordon, 1989b). Research has also indicated that children's ability to process rhythm patterns along with pulse matures around age seven (Paananen, 2006). Petzold (1963) found that the most significant auditory perception development occurs around age seven, and reaches a

plateau around age eight. Since music aptitude stabilizes around nine years of age, the music aptitudes of second-grade students are still in the developmental stage (Gordon, 1989b).

Class size of the four classes in this study ranged from 21 to 22 students (see Table 2): Group A [control] (n = 22), Group B [instruments] (n = 21), Group C [voice] (n = 22), Group D [instruments and voice] (n = 21). Out of 86 total students in these four classes, 54 students returned signed parental consent and minor assent forms to participate in the study. Participants at the beginning of the study (N = 54) were students aged seven to eight years. In each group, the number of participants were: (a) Group A (n = 10), (b) Group B (n = 11), (c) Group C (n = 15), (d) Group D (n = 18). Information about the participants is listed in the table below (see Table 3). During the study, three participants moved and left the school. Four students were absent during the questionnaire administration and five students were absent during the final PMMA test administration. A total of 50 participants completed the questionnaire, 49 total participants completed both the pre- and posttests of the PMMA, and 47 total participants completed the questionnaire and the pre- and posttests of the PMMA (see Tables 4, 5, and 6).

Table 2

Total Class Information at Beginning of Study

Class	Male	Female	Total in Class
Group A Class – Control	11	11	22
Group B Class – Instruments	11	10	21
Group C Class – Voice	10	12	22
Group D Class – Instruments and Voice	10	11	21
Total	42	44	86

Table 3

Participant Information at Beginning of Study

Group	Male	Female	Total in Study
Group A – Control	4	6	10
Group B – Instruments	5	6	11
Group C – Voice	7	8	15
Group D – Instruments and Voice	9	9	18
Total	25	29	54

Table 4

Participant Information for Questionnaire

Group	Male	Female	Total for Questionnaire
Group A – Control	4	5	9
Group B – Instruments	5	6	11
Group C – Voice	7	5	12
Group D – Instruments and Voice	9	9	18
Total Questionnaire Responses	25	25	50

Table 5

Participant Information for Primary Measures of Music Audiation (PMMA)

Group	Male	Female	Total for PMMA
Group A – Control	3	6	9
Group B – Instruments	5	6	11
Group C – Voice	6	6	12
Group D – Instruments and Voice	8	9	17
Total Pre- and Posttest Responses	22	27	49

Table 6

Participant Information for Questionnaire and Primary Measures of Music Audiation (PMMA)

Group	Male	Female	Total for Questionnaire and PMMA
Group A – Control	3	5	8
Group B – Instruments	5	6	11
Group C – Voice	6	5	11
Group D – Instruments and Voice	8	9	17
Total	22	25	47

All students in the school participated in music classes, which were taught by one full-time and one part-time music teacher. Each K – 5 class received music lessons from one of the two music teachers once a week for 45-minute class periods. The full-time regular music teacher taught music class in the designated music classroom, while the part-time music teacher taught music class in a separate classroom in another part of the school. The four second-grade classes in this study received music instruction from the regular music teacher in the designated music classroom. Students who were taught by the regular music teacher in the designated music classroom had access to Orff Schulwerk barred instruments, a variety of rhythm instruments, music textbooks, and a Smart Board.

Data Collection Instruments

Prior to the treatment period, all participants were administered the *Primary Measures of Music Audiation* (PMMA). At the conclusion of the treatment period, a second administration of the PMMA was given to participants. The PMMA (1979), which was created by Edwin Gordon, is designed for participants in Kindergarten through third grade and consists of two tests: tonal and rhythm. These tests measure tonal and rhythm aptitudes by requiring participants to listen to a pair of tonal or rhythm patterns and indicate whether they are the same or different. The answer sheets require participants to circle pictures of faces that are the same or different, in order to indicate their answer. The PMMA also yields a composite score, which is the sum of the tonal and rhythm subtests' raw scores. While Gordon indicated, "it is preferable that the *Tonal* test and the *Rhythm* test be administered on different days within one week" (1986, p. 29), the tonal and rhythm subtests were administered within the same class period due to schedule conflicts. Following Gordon's (1986) recommendations, the tonal subtest was administered before the rhythm subtest. Each subtest takes approximately 15 – 20 minutes to administer, for a total of no more than 40 minutes for the entire measurement. The PMMA was administered in the same manner for each group during the pretest and the posttest administrations, following directions in the test manual.

Music aptitude tests measure musical ability and one's potential to achieve in music. This differs from a music achievement test, which measures what someone has learned about music. Edwin Gordon's research indicates that music aptitude stabilizes around age nine, which typically occurs in the latter half of third grade. Since the

participants in this study ranged from seven to eight years of age, their music aptitude was still in the developmental stage. The PMMA was chosen for this study because it is designed to measure the aural discrimination abilities and developmental aptitudes of children ages five through nine. Music achievement tests, which typically include tonal and rhythm aural discrimination tests, are often designed for older students. Colwell's *Music Achievement Tests* (1969; 1970) and Gordon's *Iowa Tests of Music Literacy* (1970) are well-known achievement tests. Both of these measures are designed for participants in grades 4 – 12. The use of music aptitude tests as measures of aural discrimination ability is supported in previous studies (Falcetta, 2014; Gromko & Walters, 1999; Kwiatkowski, 2001; Lucas & Gromko, 2007; May, 1985; McDonald, 1991; Shuler, 1991).

The PMMA is a standardized, reliable, and valid instrument for measuring developmental music aptitude (Gordon, 1986). Table 7 indicates the reported standardized split-halves reliability coefficients of each subtest for second-grade students (Gordon, 1986). Table 8 shows the split-halves reliability coefficients for each subtest for the PMMA posttest for the second-grade students in the current study.

Table 7

Primary Measures of Music Audiation (PMMA) Standardized Reliabilities – Grade 2

Test	*N*	*Split-Halves Reliability*
Tonal	280	.89
Rhythm	280	.86
Composite	280	.92

(Gordon, 1986, p. 91)

Table 8

Current Study Primary Measures of Music Audiation (PMMA) Reliabilities

Test	*N*	*Pretest Split-Halves Reliability*	*Posttest Split-Halves Reliability*
Tonal	49	.51	.74
Rhythm	49	.76	.57
Composite	49	.56	.56

During the week of September 22, 2015, participants were administered the Music Experience/Music Activity Preference Questionnaire (see Appendix A) during their music class to determine the extent of their musical experience and their music activity preferences. The questionnaire consisted of 20 multiple-choice questions in three categories: music experience, out-of-class music preferences, and in-class music activity preferences. Each participant was given a paper copy of the questionnaire and was provided a pencil to use. I administered the questionnaire by reading aloud each question

and answer choice, allowing time for participants to choose their answer before moving on to the next question. The questionnaire took approximately 15 – 20 minutes to complete. During subsequent class periods following completion of the questionnaire, some students were selected at random to be interviewed by me to provide additional information about their questionnaire responses.

The questionnaire was pilot-tested with different second-grade participants prior to the administration of the current study to establish test reliability. Participants of the pilot test group (N = 13) were members of a second-grade classroom, from the same school site, that was not randomly selected for the current study. Pilot testing of the questionnaire took place during one music class period on August 31, 2015 with participants in the pilot test group. The questionnaire was administered to the pilot group again two weeks later during one music class period on September 14, 2015 (Hopkins, 1998). Reliability of the questionnaire was established using a test-retest method of correlation analysis and achieved a coefficient of reliability of .76, which was an acceptable level of reliability for a researcher-constructed instrument (Nunnally & Bernstein, 1994). Items in the questionnaire were modeled after similar instruments that measured participants' music background experiences (Yoder-White, 1993) and music activity preferences (Bowles, 1998). The music experience items in the questionnaire were created to determine whether participants sang or played instruments outside of school and for how long, had ever taken music lessons outside of school and for how long, and whether their family sang or played instruments at home. These are typical experiences that may occur for elementary-aged children. The out-of-class music

preference items were selected based on previous research of young children's music preferences (Geringer & Guerra, 2002; LeBlanc, Sims, Siivola, & Obert, 1996; May, 1985; Roulston, 2006). The music activities included in the questionnaire were representative of activities found in the *Spotlight on Music* (2005) textbooks and were typical second-grade music activities in the Winston-Salem/Forsyth County school system. Based on the support of the previously cited questionnaire instruments and research, and the representative nature of the music experience and music activity items, the questionnaire contained content validity.

Data Collection Procedures

I examined the effects of aural instruction with tonal and rhythm patterns from Edwin Gordon's Music Learning Theory on the tonal and rhythmic discrimination abilities of general music students in second grade. The tonal and rhythm patterns were drawn from the learning sequence activities in the tonal register and rhythm register books from the *Jump Right In: The Music Curriculum.* I instructed the experimental and control groups once a week for ten minutes each class period, from September 8 – December 4, 2015. This treatment period was of similar length to previous studies about Music Learning Theory (Bernhard, 2003; Falcetta, 2014; Grutzmacher, 1987; McDonald, 1991; O'Donnell, 2011), and exceeded Edwin Gordon's recommendation of a minimum of one month between administrations of music aptitude tests to the same participants (Gordon, 2012). I met with each class once a week for the first ten minutes of a 45-minute music class period. Group B (instruments group) did not receive instruction during the tenth week of instruction due to a school holiday.

Students in the second-grade classes whose parents did not provide consent for participation in the study were still able to participate in the instructional aspects of the study. I taught lessons with Group A (control group), Group C (voice group), and Group D (instruments and voice group), in the music room with participants and non-participants together. Due to a non-participant parental concern, I taught lessons with Group B (instruments group) in the school's auditorium, while the regular music teacher taught the non-participants next door in the music room. Non-participants who were members of the second-grade classes involved in the study did not take the PMMA or the questionnaire, and were not interviewed. The regular music teacher provided music activities for non-participants while participants took the PMMA and completed the questionnaire.

The four intact second-grade classes were assigned randomly to three experimental groups and one control group. The three experimental groups were assigned randomly to one of three conditions: (a) playing instruments only (Group B), (b) singing and chanting only (Group C), (c) singing, chanting, and playing instruments (Group D). Tonal and rhythm pattern instruction occurred on alternating weeks. The two types of pattern instruction are separated because "students need unstructured time to audiate and assimilate what they have learned in music" (Gordon, 2001, p. 25). Due to the lack of availability of local elementary music teachers certified in Music Learning Theory, I served as the instructor for this study. I obtained Elementary General Level One certification from the Gordon Institute of Music Learning in July 2015. The table below

indicates the research timeline for the study, as well as the test administration and instruction details for each group (see Table 9).

Table 9

Research Timeline

	Group A: No Pattern Instruction (Control Group)	**Group B: Pattern Instruction using Instruments**	**Group C: Pattern Instruction using Singing and Chanting**	**Group D: Pattern Instruction using Singing, Chanting, and Playing Instruments**
Prior to Treatment: Aug. 31 – Sept. 4	PMMA Pretest	PMMA Pretest	PMMA Pretest	PMMA Pretest
Week #1: Sept. 8 - 11	Classroom activities from the *Spotlight on Music* textbook	Tonal patterns: Playing glockenspiels	Tonal patterns: Singing	Tonal patterns: Singing and playing glockenspiels
Week #2: Sept. 14 - 18	Classroom activities from the *Spotlight on Music* textbook	Rhythm patterns: Playing rhythm sticks	Rhythm patterns: Chanting	Rhythm patterns: Chanting and playing rhythm sticks
Week #3: Sept. 21 - 25	Music Experience & Music Activity Preferences Questionnaire; Classroom activities from the *Spotlight on Music* textbook	Music Experience & Music Activity Preferences Questionnaire; Tonal patterns: Playing glockenspiels	Music Experience & Music Activity Preferences Questionnaire; Tonal patterns: Singing	Music Experience & Music Activity Preferences Questionnaire; Tonal patterns: Singing and playing glockenspiels

Week #4: Sept. 28 – Oct. 2	Classroom activities from the *Spotlight on Music* textbook	Rhythm patterns: Playing rhythm sticks	Rhythm patterns: Chanting	Rhythm patterns: Chanting and playing rhythm sticks
Week #5: Oct. 5 - 9	Classroom activities from the *Spotlight on Music* textbook	Tonal patterns: Playing glockenspiels	Tonal patterns: Singing	Tonal patterns: Singing and playing glockenspiels
Week #6: Oct. 12 - 16	Classroom activities from the *Spotlight on Music* textbook	Rhythm patterns: Playing rhythm sticks	Rhythm patterns: Chanting	Rhythm patterns: Chanting and playing rhythm sticks
Week #7: Oct. 19 - 23	Classroom activities from the *Spotlight on Music* textbook	Tonal patterns: Playing glockenspiels	Tonal patterns: Singing	Tonal patterns: Singing and playing glockenspiels
Week #8: Oct. 27 - 30	Classroom activities from the *Spotlight on Music* textbook	Rhythm patterns: Playing rhythm sticks	Rhythm patterns: Chanting	Rhythm patterns: Chanting and playing rhythm sticks
Week #9: Nov. 2 - 6	Classroom activities from the *Spotlight on Music* textbook	Tonal patterns: Playing glockenspiels	Tonal patterns: Singing	Tonal patterns: Singing and playing glockenspiels
Week #10: Nov. 9 - 13	Classroom activities from the *Spotlight on Music* textbook	Did not meet due to a school holiday	Rhythm patterns: Chanting	Rhythm patterns: Chanting and playing rhythm sticks
Week #11: Nov. 16 - 20	Classroom activities from the *Spotlight on Music* textbook	Tonal patterns: Playing glockenspiels	Tonal patterns: Singing	Tonal patterns: Singing and playing glockenspiels

Week #12: Nov. 30 – Dec. 4	Classroom activities from the *Spotlight on Music* textbook	Rhythm patterns: Playing rhythm sticks	Rhythm patterns: Chanting	Rhythm patterns: Chanting and playing rhythm sticks
After Treatment: Dec. 7 - 16	PMMA Posttest	PMMA Posttest	PMMA Posttest	PMMA Posttest

Group A (control group) did not receive tonal and rhythm pattern instruction; instead, I instructed participants for ten minutes each class period using classroom activities, including singing and playing instruments, from the *Spotlight on Music* second-grade music textbook series (see Appendix D for a sample lesson). Materials used in lessons for the control group included the *Spotlight on Music* teacher textbook, CDs, student textbook, and digital textbook for use with a Smart Board. Xylophones and classroom rhythm instruments were also used during lessons. Lessons were chosen from the *Spotlight on Music* textbook in coordination with the curriculum set forth by the regular music teacher at the elementary school. I followed the lesson plans from the textbook for each of my ten-minute lessons with the control group. All participants received the same instruction from their regular music teacher for the remainder of each class period. Students participated in a variety of classroom activities with their regular music teacher, including singing, playing instruments, moving, listening, improvising, and composing.

I instructed participants in the experimental groups using tonal and rhythm patterns from Edwin Gordon's tonal and rhythm register books (Gordon, 1990a; Gordon, 1990b). I followed the procedures for pattern instruction from the *Reference Handbook*

for Using Learning Sequence Activities (Gordon, 2001). Using the PMMA pretest scores from the study participants, I determined the percentile rank of each participant for the tonal and rhythm subtests, as indicated in the PMMA test manual (Gordon, 1986). Following Gordon's instructional suggestions for differentiation, the percentile rank determined each participant's pattern instruction category: (a) 80% or higher = high, (b) 21% - 79% = average, (c) 20% or lower = low (Gordon, 1986). These percentile ranks and categories were not shared with participants; I used these as instructional tools for differentiation of pattern difficulty level. The learning sequence activities contained in the tonal and rhythm register books are organized sequentially, following the skill (i.e., singing, chanting, use of syllables), content (i.e., types of tonal and rhythm patterns), and context (i.e., tonalities and meters) of Gordon's Music Learning Theory (Gordon, 2011). Each activity, called the "criterion," within a tonal or rhythm unit features patterns and instructions for teacher presentation. Most of the patterns for the learning sequence activities in the tonal and rhythm register books are divided into three audiation difficulty levels: easy, moderately difficult, and difficult. All students were instructed with the tonal and rhythm patterns that were easy to audiate, regardless of their percentile rank on the PMMA. When instructing participants and non-participants in the same class, all non-participants were instructed using the "easy" patterns, since they did not have data from the PMMA. Participants who scored in the "average" category were instructed using the "easy" and "moderately difficult" patterns, and participants who scored in the "high" category were instructed using the "easy," "moderately difficult," and "difficult" patterns (Gordon, 2001). Following Gordon's suggestions (2001), if a participant who scored in

the “low” or “average” category mastered the given patterns with ease, I instructed him/her with patterns in the next highest category.

During the twelve-week instruction period, only some of the skills, content, and context of Gordon’s learning sequence activities were used due to instructional sequencing procedures. Following Gordon’s guidelines for instruction,

> When at least 4 of every 5 students in a class or performance group (approximately 80 percent of students) achieve their potential on a criterion, you should move ahead to the following criterion on the next page in the register book (Gordon, 2001, p. 16).

Participants in all experimental groups were instructed with tonal patterns in the aural/oral skill level, using tonic and dominant content, and in major context. Rhythm pattern instruction for participants in experimental groups C (voice) and D (instruments and voice) included rhythm patterns in the aural/oral and verbal association skill levels, using macrobeat and microbeat content, and in usual duple and usual triple context. Instruction for group B (instruments) did not include the verbal association skill level for rhythm patterns.

Group B (instruments) was instructed using Edwin Gordon’s aural-based tonal patterns in Music Learning Theory for ten minutes each class period during a treatment week and rhythm patterns the next treatment week. The students in this group played the tonal patterns on glockenspiels and played the rhythm patterns on rhythm sticks (see Appendix E for a sample lesson). Due to a non-participant’s parental concerns, I instructed the participants in the auditorium while the regular music teacher instructed the

non-participants in the music room. I followed the instructional procedures set forth in the *Reference Handbook for Using Learning Sequence Activities* (Gordon, 2001), substituting playing the rhythm patterns on rhythm sticks instead of chanting, and substituting playing the tonal patterns on glockenspiels instead of singing. Rhythm syllables and tonal syllables were not used with this treatment group.

Group C (voice) was instructed using Edwin Gordon's aural-based tonal patterns in Music Learning Theory for ten minutes each class period during a treatment week and rhythm patterns the next treatment week. The students in this group engaged in singing the tonal patterns and chanting the rhythm patterns (see Appendix F for a sample lesson). I followed the instructional procedures set forth in the *Reference Handbook for Using Learning Sequence Activities* (Gordon, 2001).

Group D (instruments and voice) was instructed using Edwin Gordon's aural-based tonal patterns in Music Learning Theory for ten minutes each class period during a treatment week and rhythm patterns the next treatment week. The students in this group sang the tonal patterns while playing those patterns on glockenspiels and chanted the rhythm patterns while playing those patterns on rhythm sticks (see Appendix G for a sample lesson). I followed the instructional procedures set forth in the *Reference Handbook for Using Learning Sequence Activities* (Gordon, 2001), adding into instruction playing the rhythm patterns on rhythm sticks while chanting, and adding into instruction playing the tonal patterns on glockenspiels while singing.

All participants received the same instruction from their regular music teacher for the remainder of each class period. Students participated in a variety of classroom

activities with their regular music teacher, including singing, playing instruments, moving, listening, improvising, and composing.

To control for teacher bias, lessons taught by me were video recorded and reviewed to evaluate teaching consistency across all groups. Three licensed music teachers certified in Music Learning Theory were selected and trained by me to review and evaluate the recorded lessons. Using procedures and forms based on those suggested by Madsen and Madsen (1998), the trained observers checked for any inconsistencies of teacher approval or disapproval of students' academic and social behaviors during the lessons.

Instructions for observing and evaluating the recorded lessons were provided to the three music teachers, using the guidelines indicated by Madsen and Madsen (1998). A Teacher Approval/Disapproval Observation Form, developed by Madsen and Madsen (1998) was used as a model for the modified observation form used for this study. The observation form includes academic and social approval and disapproval codes for observed teacher behaviors in conjunction with student responses and behaviors. The original form from Madsen and Madsen (1998) included approval and disapproval mistakes from the teacher, as a means of examining behaviors for improvement. For the purposes of this study, only the academic and social approval and disapproval codes for behaviors were used in order to evaluate the teaching behavior consistency across instructional groups (see Appendix G). Previous studies (Butler, 2001; MacLeod, 2010, McKoy, 2004) have used evaluation tools such as these to examine teacher instructional and behavioral equality.

The observation form consisted of five one-minute observations. Each one-minute observation was divided into six ten-second intervals. During intervals one, three, and five, the observers viewed the recorded lesson for 10 seconds. During intervals two, four, and six, the observers typed or digitally highlighted one or more of the behavioral codes for the observed interval. If none of the behaviors were observed, the observers drew a line through the codes or left a blank space for that interval. The behavioral codes were created by Madsen and Madsen (1998) and defined as the following:

1. Aa: Approval for academic behavior is recorded if the teacher indicates that academic work is correct. Academic approval usually involves words, spoken or written. The observer should watch carefully to determine if physical expressions, closeness, activities, or things…are specifically paired with correct answers, indicating attention or commendation for the correct answer rather than the 'working' itself.
2. As: Approval for social behavior is recorded if the teacher gives any approving response paired specifically with appropriate social behavior. This category includes words, physical expressions, closeness, activities, and things directed toward any social behavior (following rules, working, cooperating, getting on-task).
3. Da: Disapproval for academic behavior includes any disapproval indicating that a student's response to the curriculum materials was incorrect. Disapproval in classrooms generally involves words, spoken or written (grades), but one should not overlook physical expression, closeness…, or deprivation of activities or things.
4. Ds: Disapproval for social behavior given by the teacher follows any disruption of the learning environment that interferes with learning. Disapproval includes words, spoken or written, that reprimand…Disapproval also includes bodily expressions such as frowning, grimacing, or shaking a fist…
   (Madsen & Madsen, 1998, p. 242 – 243)

I added audiovisual instructions to the videos using Roxio Creator Pro 2012 editing software. These audiovisual instructions were included to ensure that all observers

were responding to the same segments on the video (e.g., Madsen, 2003). For example, during the first interval, observers heard a recorded verbal narration cue of "observe" and saw the word "observe" appear on the video. After the audiovisual cue, the observers viewed the lesson for ten seconds. At the beginning of the second interval, observers heard a recorded verbal narration cue of "record" and saw the word "record" appear on the video. After the audiovisual cue, the observers had ten seconds to record any behavioral codes that were seen in the first interval. This process was repeated for each ten-second interval of all the five-minute lesson segments used for observation evaluation. Each five-minute lesson segment was uploaded to a Google Drive folder and shared with each observer.

In order to establish interobserver reliability among the three observers, Madsen and Madsen (1998) recommended that observation of at least 20% of the total lessons presented for evaluation was necessary to establish reliability. The researchers indicated that a reliability coefficient of .80 was the minimum acceptable level (Madsen & Madsen, 1998). Since the instructional period lasted 12 weeks for the four groups, there were 48 scheduled lessons. One of the lessons for Group C did not occur due to a school holiday, so there were 47 lessons available for observation. According to the reliability recommendations, a minimum of nine total lessons, each lasting no fewer than two minutes each, should be used for effective evaluation. I chose to use 12 lessons in total (three from each of the four groups), and lesson segments lasting five minutes each.

The three observers participated in training sessions to establish reliability. Using the reliability formula suggested by Madsen and Madsen (1998), the number of times the

three observers agreed for each behavior code was divided by the sum of the total number of agreements and disagreements. At the end of the training sessions, an interobserver reliability coefficient of 0.82 was obtained, which indicated that the reliability of the observers was acceptable (Madsen & Madsen, 1998).

After the completion of the training sessions, the three observers evaluated 12 additional randomly-selected lessons (three from each of the four groups), each lasting five minutes each. Using the same procedures that were used during the training sessions, the observers evaluated the lessons for any inconsistencies of teacher approval or disapproval of students' academic and social behaviors. The observers' academic and social approval and disapproval evaluations were averaged for each observed lesson and means were compared across the instructional groups. These findings are reported in Chapter IV.

Data Analysis Procedures

At the conclusion of the treatment period and the administration of the posttests, the data were analyzed. The dependent variables were the posttest scores on the PMMA tests and the primary independent variable was the type of instruction. Descriptive statistical analyses were conducted to determine measures of central tendency. Using the pretest as the covariate, an Analysis of Covariance (ANCOVA) was performed to determine whether there were any significant main effects or interaction effects of instruction. Data from the 49 total participants who completed the pre- and posttests of the PMMA were used in the ANCOVA analyses. Results were analyzed using IBM© SPSS© Statistics Version 22.

Stepwise multiple regression analyses were conducted to determine whether there were significant relationships among the extent of music experience, preference for music activities, and the PMMA posttest scores. The dependent variables were the posttest scores on the PMMA and the secondary independent variables were data from a researcher-created Music Experience/Music Activity Preference questionnaire. Data from the 47 total participants who completed the questionnaire and the pre- and posttests of the PMMA were used in the multiple regression analyses. Results were analyzed using IBM© SPSS© Statistics Version 22.

The researcher-created music experience and music activity preferences questionnaires were analyzed by calculating the frequency of positive responses in each possible answer. Data from the 50 total participants who completed the questionnaire were used in the questionnaire analyses. Percentages of each response were obtained in reference to the number of participants in each group, as well as to the total number of participants who completed the questionnaire. A total of 11 participants were selected at random to be interviewed by me to provide additional information about their questionnaire responses. These interviews were transcribed and analyzed to find themes which would help me to better understand the reasons for the participants' responses toward music class activities and school music performances.

CHAPTER IV

RESULTS

The primary purpose of this quasi-experimental study was to investigate the effect of aural instruction with tonal and rhythm patterns from Edwin Gordon's Music Learning Theory on the tonal and rhythmic discrimination abilities across four groups of second-grade students. Each intact second-grade class was assigned randomly to one of four groups: (a) Group A: no pattern instruction (control group), (b) Group B: pattern instruction using instruments only, (c) Group C: pattern instruction using singing and chanting only, and (d) Group D: pattern instruction using singing, chanting, and playing instruments. The dependent variables were the posttest scores on the *Primary Measures of Music Audiation* (PMMA) and the primary independent variable was the type of instruction. Primary research questions associated with the present study included:

1. Is there a significant main effect of aural instruction with Edwin Gordon's tonal and rhythm patterns in music learning theory on the tonal discrimination abilities across the four groups of second-grade students?
2. Is there a significant main effect of aural instruction with Edwin Gordon's tonal and rhythm patterns in music learning theory on the rhythmic discrimination abilities across the four groups of second-grade students?

The secondary purpose of this study was to determine whether there was a relationship among the extent of music experience, music activity preference, and the tonal and

rhythmic discrimination abilities across the four groups of second-grade students. The dependent variables were the posttest scores on the PMMA and the secondary independent variables were data from a researcher-created Music Experience/Music Activity Preference questionnaire. Secondary research questions associated with the present study included:

3. Is there a relationship among the extent of music experience, preference for music activities, and the tonal discrimination abilities across the four groups of second-grade students?
4. Is there a relationship among the extent of music experience, preference for music activities, and the rhythmic discrimination abilities across the four groups of second-grade students?
5. What are the preferences of second-grade students for music class activities and performances?

Participants in this study were students, aged seven to eight years, in four intact second-grade classes at one elementary school in North Carolina. Class sizes ranged from 21 to 22 students: Group A [control] (n = 22), Group B [instruments] (n = 21), Group C [voice] (n = 22), Group D [instruments and voice] (n = 21). Out of 86 total students in these four classes, 54 students returned signed parental consent and minor assent forms to participate in the study. At the beginning of the study, the number of participants in each group was: a) Group A (n = 10), b) Group B (n = 11), c) Group C (n = 15), d) Group D (n = 18). Apparent gender of these participants were: a) 4 males and 6 females in Group A, b) 5 males and 6 females in Group B, c) 7 males and 8 females in Group C, d) 9 males

and 9 females in Group D. During the study, three participants moved and left the school. Four students were absent during the questionnaire administration and five students were absent during the final PMMA test administration. A total of 50 participants completed the questionnaire, 49 total participants completed both the pre-and posttests of the PMMA, and 47 total participants completed the questionnaire and the pre- and posttests of the PMMA.

Prior to the treatment period, all participants were administered the *Primary Measures of Music Audiation* (PMMA). At the conclusion of the treatment period, a second administration of the PMMA was given to participants. Participants were administered a researcher-created questionnaire to determine the extent of their musical experience, their music preferences, and their music activity preferences. A total of 11 students who completed the questionnaire were selected at random to be interviewed by me to provide additional information about their questionnaire responses.

To control for teacher bias, lessons taught by me were video recorded and reviewed to evaluate teaching consistency across all groups. Three licensed music teachers certified in Music Learning Theory were selected and trained by me to review and evaluate the recorded lessons. Using procedures and forms based on those suggested by Madsen and Madsen (1998), the trained observers checked for any inconsistencies of teacher approval or disapproval of students' academic and social behaviors during the lessons. An interobserver reliability coefficient of 0.82 was obtained during training sessions, which indicated that the reliability of the observers was acceptable (Madsen & Madsen, 1998). Evaluation data from 12 lessons in total (three from each of the four

groups), with lesson segments lasting five minutes each, were used to examine teacher approval or disapproval across all groups. The observers' academic and social approval and disapproval evaluations were averaged for each observed lesson and means were compared across the instructional groups. Combined academic and social approval means for the groups were as follows: Group A (16.3), Group B (15.4), Group C (15.5), and Group D (15.1). Combined academic and social disapproval means for the groups were as follows: Group A (0.2), Group B (0.7), Group C (0.1), and Group D (1.1). These results indicated that consistency of teacher approval and disapproval of students' academic and social behaviors across instructional groups were established.

Research Questions 1 and 2

Is there a significant main effect of aural instruction with Edwin Gordon's tonal and rhythm patterns in music learning theory on the tonal discrimination abilities across the four groups of second-grade students?

Is there a significant main effect of aural instruction with Edwin Gordon's tonal and rhythm patterns in music learning theory on the rhythmic discrimination abilities across the four groups of second-grade students?

To answer the primary research questions, an Analysis of Covariance (ANCOVA) was performed, using the pretests of each subtest as the covariates, to determine whether there were any significant main effects or interaction effects of instruction. Descriptive statistical analyses were conducted to determine measures of central tendency. Results were analyzed using IBM© SPSS© Statistics Version 22.

The means for the PMMA tonal, rhythm, and composite pretest and posttest scores were examined within each group. For the PMMA tonal subtest (see Table 10 and Figure 1), Groups A (control), C (voice), and D (instruments & voice) showed significant positive gains from the mean scores of the pretest to the posttest ($p < .05$). The mean of Group B (instruments) also increased from the pretest to the posttest, but the gains were not significant ($p > .05$). For the PMMA rhythm subtest (see Table 11 and Figure 2), Group B showed a significant decrease from the mean scores of the pretest to the posttest ($p < .05$), while the means of the other groups had nonsignificant increases. For the PMMA composite mean scores (see Table 12 and Figure 3), Groups A, C, and D showed significant positive gains from the scores of the pretest to the posttest ($p < .05$). The composite mean of Group B had a nonsignificant decrease.

Table 10

Paired T-Test Descriptive Statistics for the Primary Measures of Music Audiation (PMMA) Tonal

Group		**Tonal Pretest**	**Tonal Posttest**			
	n	*Mean*	*Mean*	*SD*	*t*	*Sig.*
Group A – Control	9	31.22	34.77	3.08	-3.456	.009*
Group B – Instruments	11	31.36	33.27	5.48	-1.154	.275
Group C – Voice	12	29.83	33.00	3.21	-0.3413	.006*
Group D – Instruments and Voice	17	27.52	32.70	4.95	-4.309	.001*

*$p < .05$

Figure 1

Pretest and Posttest Mean Scores for the Primary Measures of Music Audiation (PMMA) Tonal

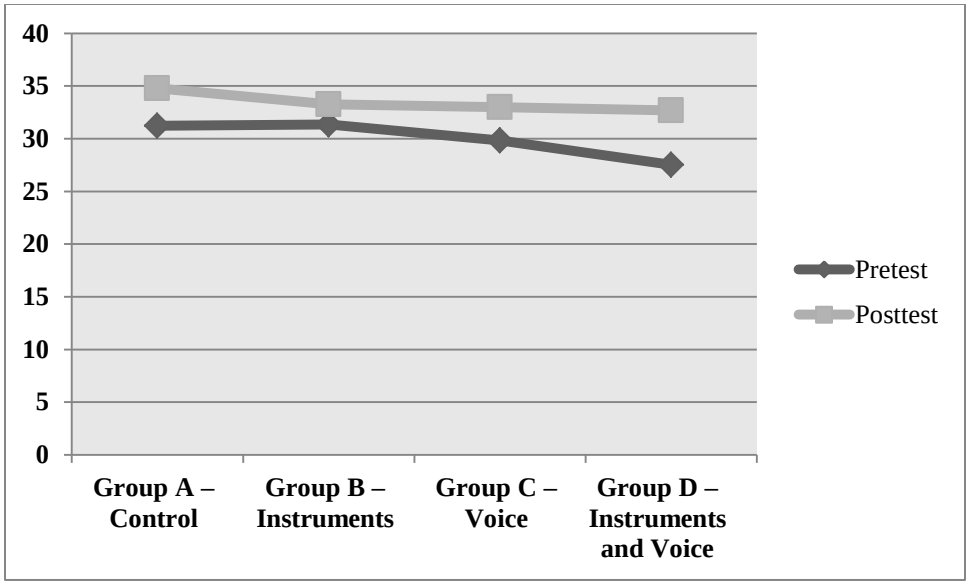


Table 11

Paired T-Test Descriptive Statistics for the Primary Measures of Music Audiation (PMMA) Rhythm

Group		Rhythm Pretest	Rhythm Posttest			
	n	*Mean*	*Mean*	*SD*	*t*	*Sig.*
Group A – Control	9	26.22	28.77	4.33	-1.769	.115
Group B – Instruments	11	29.09	25.45	4.67	2.580	.027*
Group C – Voice	12	23.08	25.08	5.75	-1.204	.254
Group D – Instruments and Voice	17	25.41	25.70	4.48	-.271	.790

*$p < .05$

Figure 2

Pretest and Posttest Mean Scores for the Primary Measures of Music Audiation (PMMA) Rhythm

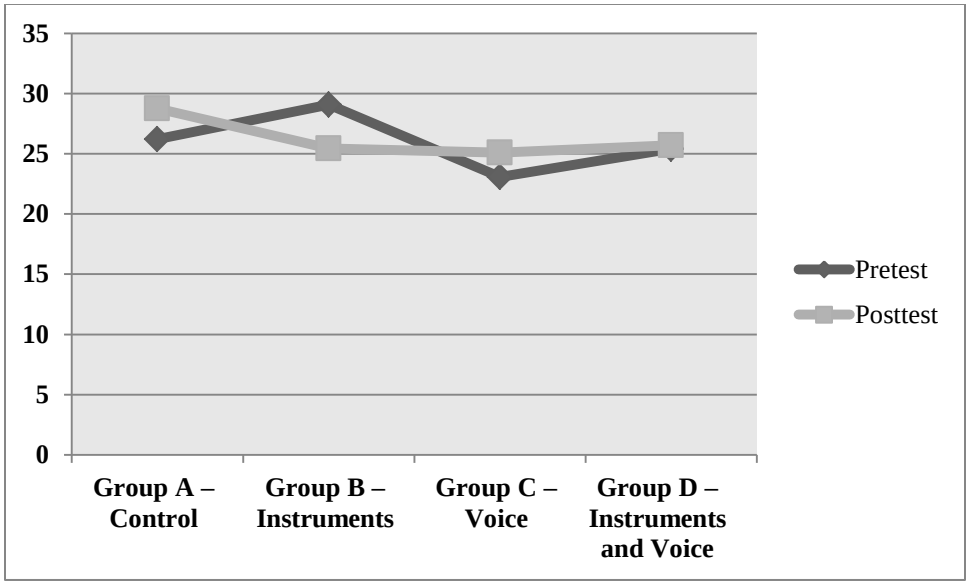


Table 12

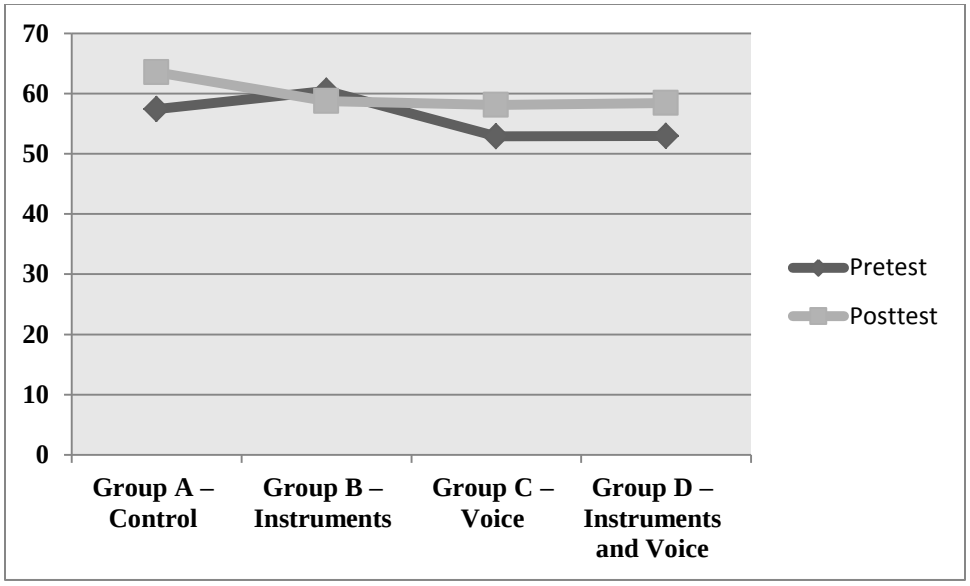
Paired T-Test Descriptive Statistics for the Primary Measures of Music Audiation (PMMA) Composite

Group		Composite Pretest	Composite Posttest			
	n	*Mean*	*Mean*	*SD*	*t*	*Sig.*
Group A – Control	9	57.44	63.55	4.04	-4.532	.002*
Group B – Instruments	11	60.45	58.72	8.84	.648	.532
Group C – Voice	12	52.91	58.08	6.54	-2.733	.019*
Group D – Instruments and Voice	17	52.94	58.41	7.48	-3.014	.008*

*$p < .05$

Figure 3

Pretest and Posttest Mean Scores for the Primary Measures of Music Audiation (PMMA) Composite



The standardized means and standard deviations of the PMMA subtests, as reported by Edwin Gordon (1986), are listed in Table 13. Compared to the standardized means of the tonal subtest (M = 32.00, SD = 4.75) from Edwin Gordon (1986), Group D had similar results (M = 32.70, SD = 4.95). Group A had a larger mean and smaller standard deviation (M = 34.77, SD = 3.08), Group B had a slightly larger mean and larger standard deviation (M = 33.27, SD = 5.48), and Group C had a slightly larger mean and a smaller standard deviation (M = 33.00, SD = 3.21).

Table 13

Primary Measures of Music Audiation (PMMA) Standardized Descriptive Statistics for Tonal, Rhythm, and Composite Tests – Grade 2

Test			
	N	*Mean*	*SD*
Tonal	280	32.00	4.75
Rhythm	280	27.70	4.55
Composite	280	59.70	8.35

(Gordon, 1986, p. 87)

Compared to Gordon's (1986) standardized means and standard deviations for the PMMA rhythm subtest (*M* = 27.70, *SD* = 4.55), Group A had a slightly larger mean and similar standard deviation (*M* = 28.77, *SD* = 4.33). Groups B (*M* = 25.45, *SD* = 4.67) and D (*M* = 25.70, *SD* = 4.48) had smaller means and similar standard deviations compared to Gordon's standards. Group C had a smaller mean as well, but a larger standard deviation (*M* = 25.08, *SD* = 5.75).

Compared to the standardized means and standard deviations of the PMMA composite scores (*M* = 59.70, *SD* = 8.35) reported by Edwin Gordon (1986), Group A had a larger mean and a much smaller standard deviation (*M* = 63.55, *SD* = 4.04). Group B had a slightly smaller mean and similar standard deviation compared to Gordon's standards (*M* = 58.72, *SD* = 8.84). Groups C (*M* = 58.08, *SD* = 6.54) and D (*M* = 58.41, *SD* = 7.48) had slightly smaller means and smaller standard deviations compared to the standards.

To check assumptions of homogeneity of variance between groups, an ANOVA was performed for the tonal, rhythm, and composite pretest scores of the PMMA for all groups prior to performing ANCOVA analyses. There were no significant differences between groups on the pretest scores of the PMMA. As a further test of the assumptions of homogeneity of regression was performed for the tonal, rhythm, and composite scores of the PMMA before performing ANCOVA analyses. There were no significant interactions between the covariates and the independent variable.

Using the PMMA tonal, rhythm, and composite pretest scores as the covariates, ANCOVA analyses were performed to determine whether there were any significant main effects or interaction effects of instruction. Results of the analyses indicated there were no significant main effects or interaction effects of instruction for any of the PMMA subtests at the .05 level of significance: PMMA Tonal [F (3, 44) = .380, p = .768]; PMMA Rhythm [F (3, 44) = 2.381, p = .082]; PMMA Composite [F (3, 44) = 1.969, p = .133]. The effect size and power of each subtest were small: PMMA Tonal [d = .025; power = .119]; PMMA rhythm [d = .140; power = .557]; PMMA Composite [d = .118; power = .473]. Since the sample size was relatively small (N = 49) and the effect size and power for each subtest were very small, the nonsignificant findings of the ANCOVA analyses were not surprising (see Tables 14, 15, and 16).

Table 14

ANCOVA for Primary Measures of Music Audiation (PMMA) Tonal

	Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared	Observed Power
Instruction	14.213	3	4.738	.380	.768	.025	.119
Error	547.930	44	12.453				
Corrected Total	690.000	48					

[F (3, 44) = .380, p = .768 > α (.05)]

Table 15

ANCOVA for Primary Measures of Music Audiation (PMMA) Rhythm

	Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared	Observed Power
Instruction	89.571	3	29.857	2.381	.082	.140	.557
Error	551.766	44	12.540				
Corrected Total	744.816	48					

[F (3, 44) = 2.381, p = .082 > α (.05)]

Table 16

ANCOVA for Primary Measures of Music Audiation (PMMA) Composite

	Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared	Observed Power
Instruction	179.770	3	59.923	1.969	.133	.118	.473
Error	1339.247	44	30.437				
Corrected Total	1971.102	48					

[F (3, 44) = 1.969, p = .133 > α (.05)]

Summary

To address the primary research questions, an Analysis of Covariance (ANCOVA) was performed, using the pretests of each subtest as the covariates, to determine whether there were any significant main effects or interaction effects of instruction. The mean scores for the PMMA tonal, rhythm, and composite pretest and posttest were examined within each group. All groups showed gains from the pretest to the posttest means on the PMMA tonal subtest; however only Groups A (control), C (voice), and D (instruments and voice) showed gains on the PMMA rhythm subtest and the composite scores. Group B's (instruments) mean scores decreased from the pretest to the posttest on the PMMA rhythm subtest and the composite. Results of the ANCOVA analyses indicated there were no significant main effects or interaction effects of instruction for any of the PMMA subtests at the .05 level of significance. Based on the results of the analyses, aural instruction with tonal and rhythm patterns from Edwin

Gordon's Music Learning Theory did not have a significant effect on the tonal and rhythmic discrimination abilities of second grade students.

Research Questions 3 and 4

Is there a relationship among the extent of music experience, preference for music activities, and the tonal discrimination abilities across the four groups of second-grade students?

Is there a relationship among the extent of music experience, preference for music activities, and the rhythmic discrimination abilities across the four groups of second-grade students?

During the week of September 22, 2015, participants were administered the Music Experience/Music Activity Preference Questionnaire during their music class. The researcher-created questionnaires were analyzed by calculating the frequency of positive responses in each possible answer. Percentages of each response were obtained in reference to the number of participants in each group, as well as to the total number of participants who completed the questionnaire. I selected a total of 11 participants at random to be interviewed to provide additional information about their questionnaire responses. These interviews were transcribed and analyzed to find themes which would help me to better understand the reasons for the participants' responses.

Table 17 shows the frequencies of responses for each question of the researcher-created Music Experience/Music Activity Preference Questionnaire.

Table 17

Music Experience/Music Activity Preference Questionnaire Results

	Music Experience	**Group A: Control Group (*n* = 9)**	**Group B: Instruments Group (*n* = 11)**	**Group C: Voice Group (*n* = 12)**	**Group D: Instruments & Voice Group (*n* = 18)**	**Total Student Responses (*N* = 50)**
Q1	**Sing or Play Instruments Outside School**	1 (11.1%)	7 (63.6%)	6 (50.0%)	8 (44.4%)	22 (44.0%)
Q2	**Singing or Playing Instruments Less Than One Year**	0 (0.0%)	5 (45.5%)	4 (33.3%)	5 (27.8%)	14 (28.0%)
	Singing or Playing Instruments More Than One Year	1 (11.1%)	2 (18.2%)	1 (8.3%)	3 (16.7%)	7 (14.0%)
Q3	**Have Taken Music Lessons Outside School**	0 (0.0%)	1 (9.1%)	2 (16.7%)	6 (33.3%)	9 (18.0%)
Q4	**Have Taken Music Lessons Less Than One Year**	0 (0.0%)	0 (0.0%)	2 (16.7%)	5 (27.8%)	7 (14.0%)
	Have Taken Music Lessons More Than One Year	0 (0.0%)	1 (9.1%)	0 (0.0%)	1 (5.6%)	2 (4.0%)
Q5	**Family Sings Songs at Home**	8 (88.9%)	9 (81.8%)	7 (58.3%)	16 (88.9%)	40 (80.0%)
Q6	**Family Plays Musical Instruments at Home**	3 (33.3%)	3 (27.3%)	2 (16.7%)	5 (27.8%)	13 (26.0%)

	Out-of-Class Music Preferences	Control Group (*n* = 9)	Instruments Group (*n* = 11)	Voice Group (*n* = 12)	Instruments & Voice Group (*n* = 18)	Total Student Responses (*N* = 50)
Q7	**Like to Listen to Music Outside of School**	8 (88.9%)	9 (81.8%)	11 (91.7%)	16 (88.9%)	44 (88.0%)
Q8	**Favorite Music Genre**					
	Pop	2 (22.2%)	4 (36.4%)	3 (25.0%)	3 (16.6%)	12 (24.0%)
	Country	2 (22.2%)	1 (9.1%)	2 (16.7%)	4 (22.2%)	9 (18.0%)
	Rock	1 (11.1%)	1 (9.1%)	4 (33.3%)	3 (16.7%)	9 (18.0%)
	Jazz	0 (0.0%)	2 (18.2%)	1 (8.3%)	0 (0.0%)	3 (6.0%)
	Classical	2 (22.2%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	2 (4.0%)
	Gospel	0 (0.0%)	0 (0.0%)	0 (0.0%)	1 (5.6%)	1 (2.0%)
	Other	2 (22.2%)	3 (27.3%)	2 (16.7%)	7 (38.8%)	14 (28.0%)

	In-Class Music Activity Preferences	Control Group (*n* = 9)	Instruments Group (*n* = 11)	Voice Group (*n* = 12)	Instruments & Voice Group (*n* = 18)	Total Student Responses (*N* = 50)
Q9	**Singing**	6 (66.7%)	6 (54.5%)	7 (58.3%)	9 (50.0%)	28 (56.0%)
Q10	**Playing Instruments**	9 (100.0%)	11 (100.0%)	10 (83.3%)	16 (88.8%)	46 (92.0%)
Q11	**Improvising & Composing**	44 (4.4%)	5 (45.5%)	5 (41.7%)	11 (61.1%)	25 (50.0%)
Q12	**Learning About Composers**	6 (66.7%)	8 (72.7%)	7 (58.3%)	11 (61.1%)	32 (64.0%)
Q13	**Playing Music Games**	8 (88.9%)	9 (81.8%)	9 (75.0%)	17 (94.4%)	43 (86.0%)
Q14	**Listening to Music**	6 (66.7%)	8 (72.7%)	10 (83.3%)	16 (88.9%)	40 (80.0%)
Q15	**Learning to read music notation**	7 (77.8%)	8 (72.7%)	7 (58.3%)	15 (83.3%)	37 (74.0%)
Q16	**Talking about music**	4 (44.4%)	7 (63.6%)	8 (66.7%)	12 (66.7%)	31 (62.0%)
Q17	**Dancing / Moving**	9 (100.0%)	7 (63.6%)	5 (41.7%)	13 (72.2%)	34 (68.0%)
Q18	**Did you participate in a music performance last year?**	7 (77.8%)	8 (72.7%)	10 (83.3%)	13 (72.2%)	38 (76.0%)
Q19	**Do you like participating in music performances at school?**	5 (55.5%)	9 (81.8%)	11 (91.7%)	15 (83.3%)	40 (80.0%)

Q20	**Favorite Music Class Activity**	**Control Group (*n* = 9)**	**Instruments Group (*n* = 11)**	**Voice Group (*n* = 12)**	**Instruments & Voice Group (*n* = 18)**	**Total Student Responses (*N* = 50)**
	Singing	2 (22.2%)	4 (36.4%)	3 (25.0%)	3 (16.7%)	12 (24.0%)
	Playing Instruments	3 (33.3%)	3 (27.3%)	3 (25.0%)	7 (38.9%)	16 (32.0%)
	Learning to read music notation	0 (0.0%)	0 (0.0%)	2 (16.7%)	1 (5.6%)	3 (6.0%)
	Composing	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)
	Talking about music	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)
	Listening to music	1 (11.1%)	2 (18.2%)	2 (16.7%)	4 (22.2%)	9 (18.0%)
	Dancing / Moving	3 (33.3%)	2 (18.2%)	2 (16.7%)	3 (16.7%)	10 (20.0%)

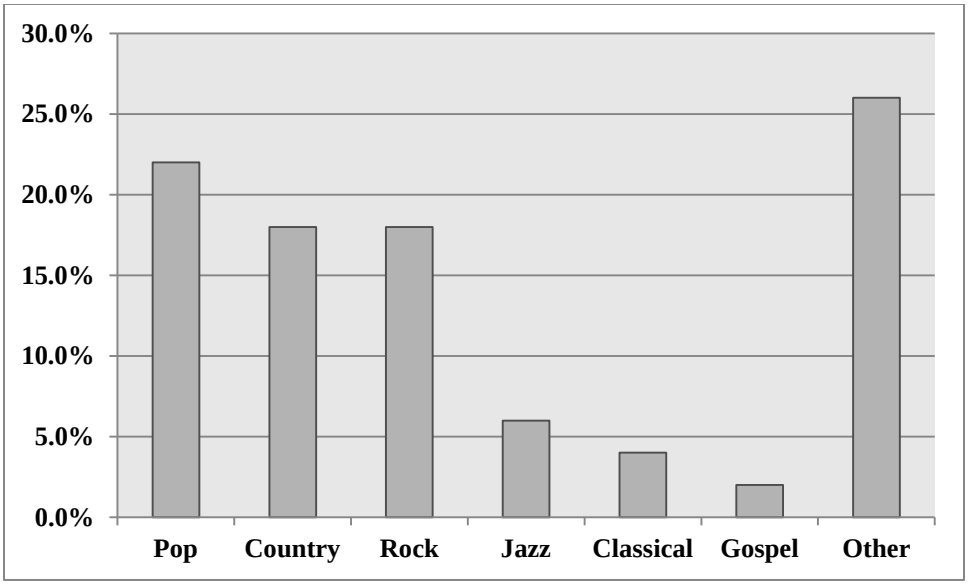
[Note: The *n* reported in each data column indicates the number of students in each group who completed the questionnaire. Data for responses to each question indicate the number and percentage of students who answered the question positively.]

Of the 50 total questionnaire responses, 22 (44%) participants self-reported that they sing or play instruments outside of school. When asked how long they had been singing or playing instruments, 14 (28%) participants responded that they had been singing or playing instruments for less than one year, and 7 (14%) for more than one year. Only 9 (18%) participants reported that they had taken music lessons outside of school for either less than (7/14%) or more than (2/4%) one year.

The majority of total participants (44/88%) indicated they liked to listen to music outside of school. Figure 4 depicts a chart of participants' music genre responses. The highest percentage of preferred genre choice was in the category of "other" (14/28%), in which participants were able to write in their own response: 5 participants (1%) indicated rap, 3 participants (0.6%) indicated "102 Jamz'" (a local hip hop radio station), 3 participants (0.6%) indicated "Kidz Bop" (commercial pop music songs sung by children with "kid-friendly" lyrics), 3 participants (0.6%) chose the "other" category but did not write in a response. Pop music received the next highest percentage response (12/24%), and country and rock genres each had 9/18% of the responses. These results are consistent with the findings of previous music preference research, in which young children typically prefer rock, pop, rap, or country music genres (Geringer & Guerra, 2002; LeBlanc, Sims, Siivola, & Obert, 1996; May, 1985; Roulston, 2006).

Figure 4

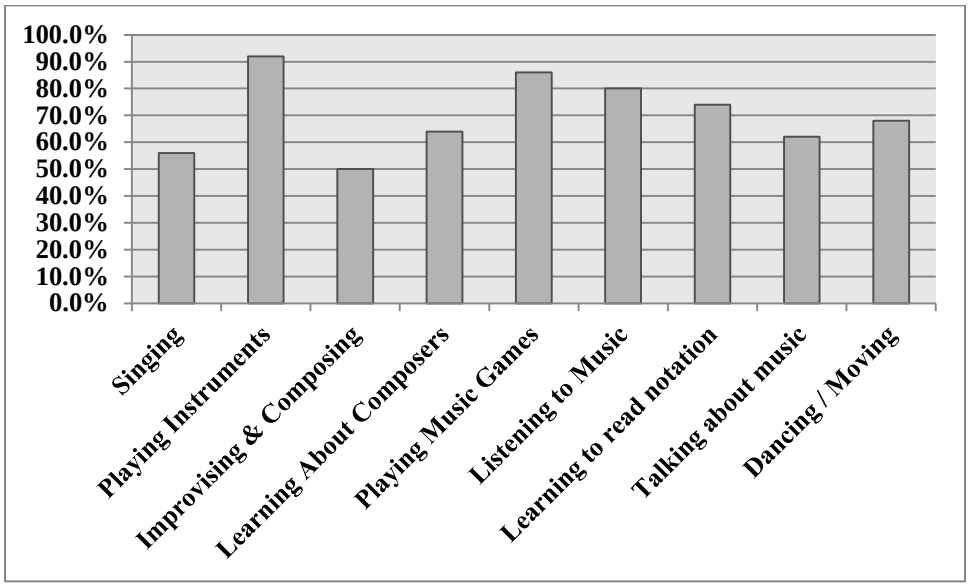
Music Genre Responses for the Music Experience/Music Activity Preference Questionnaire



When asked if they liked doing certain music activities in music class, 46 participants (92%) indicated that they liked playing instruments, 43 (86%) liked playing music games, and 40 (80%) liked listening to music (see Figure 5). Singing in music class was chosen by 28 participants (56%), and preference for improvising and composing received the lowest number of responses (25/50%).

Figure 5

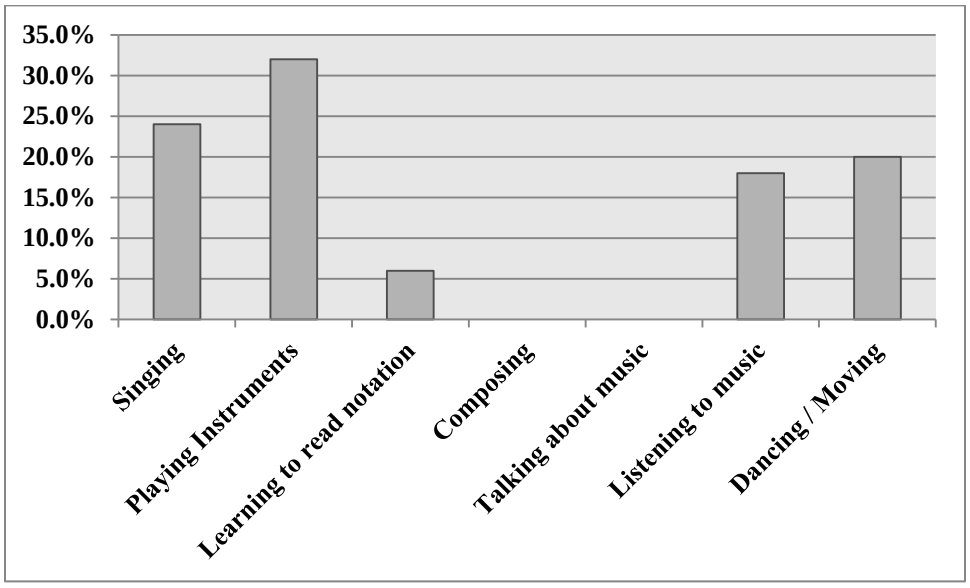
Music Class Activity Responses for the Music Experience/Music Activity Preference Questionnaire



Since the majority of participants indicated they liked playing instruments in music class (46/92%), it was not surprising that "playing instruments" was chosen as the favorite music class activity by the largest number of participants (16/32%; see Figure 6). Singing received the next highest percentage for the favorite music class activity (12/24%), although only 28/56% of participants indicated that they liked doing this activity in music class. The activities of composing and talking about music each received no responses as participants' favorite music activity, although 31/62% of participants indicated they liked talking about music and 25/50% of participants indicated they liked improvising and composing in music class.

Figure 6

Favorite Music Class Activity Responses for the Music Experience/Music Activity Preference Questionnaire



These findings are supported by previous research on students' attitudes and preferences toward music activities, in that the activity of playing instruments in music class is often given more positive attitude ratings by young students (Bowles, 1998; Broquist, 1961; Murphy & Brown, 1986; Nolin, 1973). Bowles (1998) found that in a music activity preference study of students in grades K – 5 (N = 2,251), 50% of participants indicated that playing instruments was their favorite music class activity, while 15% chose dance/movement, 14% chose singing, 11% chose listening to music, 6% chose composing, and 4% chose talking about music. When asked if they liked certain music class activities, 93% of participants indicated positive responses for playing instruments, and 81% of participants indicated positive responses for singing (Bowles, 1998).

As in the current study, Bowles (1998) found that young students had more positive attitudes overall toward playing instruments than other music class activities. Within the second-grade sample (n = 405) of Bowles's (1998) study, 50% of participants chose playing instruments as their favorite music class activity, 15% chose dance/movement, 16% chose singing, 9% chose listening to music, 7% chose composing, and 2% chose talking about music. Of the second-grade participants who completed the questionnaire in the current study (N = 50), playing instruments received the highest percentage for overall favorite music class activity (16/32%), while singing ranked as the next highest percentage (12/24%), followed by dancing and moving (10/20%), listening to music (9/18%), and learning to read music notation (3/6%). While small percentages of participants in Bowles' (1998) study chose composing (7%) and talking about music (2%) as favorite music activities, none of the participants in the current study chose those as their favorite activities. The music activity preference results of the current study are somewhat similar to the findings of Bowles' (1998) study, and further research regarding music activity preference would be beneficial to the field of music education.

Stepwise multiple regression analyses were conducted to determine whether there were significant relationships among music experience, music activity preference, and the PMMA tonal posttest scores. Pearson Product-Moment Correlations were calculated to determine whether there were significant correlations among the *Primary Measures of Music Audiation* (PMMA) tonal posttest scores and the four groups, the six music experience variables, the eight music preference variables, and the seven music activity preference variables (see Table 18).

Table 18

Pearson Product-Moment Correlations among Music Experience, Music Preference, and Music Activity Preference for Primary Measures of Music Audiation (PMMA) Tonal

Variable	Tonal Posttest P. Correlation	Sig.
Group Contrasts:		
Control – Voice/Instruments/Voice & Instruments	.144	.167
Voice – Instruments/Voice & Instruments	.037	.403
Instruments – Voice & Instruments	.090	.274
Music Experience:		
Singing and Playing Instruments	.038	.400
Extent of Singing and Playing Instruments	.018	.453
Music Lessons	-.133	.187
Extent of Music Lessons	-.107	.238
Family Sings at Home	.213	.076
Family Plays Instruments at Home	.088	.279
Music Preference:		
Listens to Music Outside School	-.087	.280
Pop Favorite Genre	.264	.037*
Country Favorite Genre	.144	.167
Rock Favorite Genre	-.013	.466
Jazz Favorite Genre	-.397	.003*
Classical Favorite Genre	.124	.204
Gospel Favorite Genre	.106	.238
Other Favorite Genre	-.232	.058*
Favorite Music Class Activity:		
Singing	.160	.141
Playing Instruments	-.050	.370
Reading Music Notation	-.046	.380
Composing	.	.000**
Talking about Music	.	.000**
Listening to Music	-.115	.220
Dancing/Moving	.022	.442

* $p < .05$

**Composing and Talking about Music variables had no student responses in the questionnaire

While the "pop" genre variable had a small, positive correlation with the PMMA tonal posttest scores, the "jazz" and "other" (i.e., rap, hip-hop, and "Kidz Bop") genre variables had small, negative correlations. Only the "jazz" and "other" genre variables were significant predictors for the tonal posttest scores (see Table 19).

Table 19

Multiple Regression for Primary Measures of Music Audiation (PMMA) Tonal

Model Summary[c]

	R	R Square	Adjusted R Square	Std. Error of the Estimate
Model 1	.397[a]	.158	.139	3.48274
Model 2	.498[b]	.248	.214	3.32780

[a] Predictors: (Constant), Jazz Favorite Genre

[b] Predictors: (Constant), Jazz Favorite Genre, Other Favorite Genre

[c] Dependent Variable: PMMA Tonal Posttest

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	**Regression**	102.387	1	102.387	8.441	.006[b]
	Residual	545.826	45	12.129		
	Total	648.213	46			
2	**Regression**	160.946	2	80.473	7.267	.002[c]
	Residual	487.267	44	11.074		
	Total	648.213	46			

[a] Dependent Variable: PMMA Tonal Posttest

[b] Predictors: (Constant), Jazz Favorite Genre

[c] Predictors: (Constant), Jazz Favorite Genre, Other Favorite Genre

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficient		
		B	**Std. Error**	**Beta**	**t**	**Sig.**
1	**(Constant)**	33.705	.525		64.194	.000
	Jazz Favorite Genre	-6.038	2.078	-.397	-2.905	.006
2	**(Constant)**	34.452	.598		57.641	.000
	Jazz Favorite Genre	-6.785	2.012	-.447	-3.372	.002
	Other Favorite Genre	-2.529	1.100	-.305	-2.300	.026

[a] Dependent Variable: PMMA Tonal Posttest

Regression formula Model 1: -6.038Jazz + 33.705
Regression formula Model 2: -6.785Jazz – 2.529Other + 34.452

Results indicated that preference for jazz and the genre labeled "other" (i.e., rap, hip-hop, and "Kidz Bop") were significant, negative predictors for PMMA tonal scores. In the first model, the Adjusted R Square indicated that preference for the jazz genre accounted for 13.9% of the variance in the PMMA tonal mean scores [F (1,45) = 8.441, $p < .05$]. Preference for jazz was associated with lower PMMA tonal scores (*Beta* = -.397, $p < .05$). In the second model, preference for the "other" genre (i.e., rap, hip-hop, "Kidz Bop") was added and the Adjusted R Square became .214. Results indicated that preference for the "other" genre accounted for 21.4% of the variance in the PMMA tonal mean scores [F (2,44) = 7.267, $p < .05$]. Preference for jazz (*Beta* = -.447, $p < .05$) and

preference for the "other" genre (*Beta* = -.305, $p < .05$) were both associated with lower PMMA tonal scores. In other words, students who preferred jazz or the "other" genre were more likely to perform poorly on the PMMA tonal discrimination test.

Stepwise multiple regression analyses were conducted to determine whether there were significant relationships among music experience, music activity preference, and the PMMA rhythm posttest scores. Pearson Product-Moment Correlations were calculated to determine whether there were significant correlations between the *Primary Measures of Music Audiation* (PMMA) rhythm posttest scores and the four groups, the six music experience variables, the eight music preference variables, and the seven music activity preference variables (see Table 20).

Table 20

Pearson Product-Moment Correlations among Music Experience, Music Preference, and Music Activity Preference for Primary Measures of Music Audiation (PMMA) Rhythm

Variable	Rhythm Posttest P. Correlation	Sig.
Group Contrasts:		
Control – Voice/Instruments/Voice & Instruments	.287	.025*
Voice – Instruments/Voice & Instruments	-.003	.493
Instruments – Voice & Instruments	-.004	.488
Music Experience:		
Singing and Playing Instruments	-.071	.319
Extent of Singing and Playing Instruments	-.123	.205
Music Lessons	-.100	.251
Extent of Music Lessons	-.146	.163
Family Sings at Home	.184	.107
Family Plays Instruments at Home	.135	.184
Music Preference:		
Listens to Music Outside School	-.043	.386
Pop Favorite Genre	.331	.012*
Country Favorite Genre	-.155	.149
Rock Favorite Genre	.048	.374
Jazz Favorite Genre	-.253	.043*
Classical Favorite Genre	-.003	.491
Gospel Favorite Genre	-.002	.493
Other Favorite Genre	-.084	.286
Favorite Music Class Activity:		
Singing	-.251	.044*
Playing Instruments	.210	.078
Reading Music Notation	-.050	.370
Composing	.	.000**
Talking about Music	.	.000**
Listening to Music	-.111	.230
Dancing/Moving	.169	.128

* $p < .05$

**Composing and Talking about Music variables had no student responses in the questionnaire

The "control – voice/instruments/voice & instruments" group contrast and the "pop" genre variable had small, positive correlations with the PMMA rhythm posttest scores. The "jazz" genre variable and the "singing" as favorite music activity had small, negative correlations with the PMMA rhythm posttest scores. Only the "control – voice/instruments/voice & instruments" group contrast, "pop," and "singing" favorite music activity were significant predictors for the rhythm posttest scores (see Table 21).

Table 21

Multiple Regression for Primary Measures of Music Audiation (PMMA) Rhythm

Model Summary[d]

	R	R Square	Adjusted R Square	Std. Error of the Estimate
Model 1	.331[a]	.109	.090	3.70840
Model 2	.446[b]	.199	.162	3.55700
Model 3	.526[c]	.277	.226	3.41888

[a] Predictors: (Constant), Pop Favorite Genre

[b] Predictors: (Constant), Pop Favorite Genre, Singing Favorite Music Activity

[c] Predictors: (Constant), Pop Favorite Genre, Singing Favorite Music Activity, Control – Voice/Instruments/Voice & Instruments

[d] Dependent Variable: PMMA Rhythm Posttest

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	**Regression**	75.958	1	75.958	5.523	.023[b]
	Residual	618.851	45	13.752		
	Total	694.809	46			
2	**Regression**	138.108	2	69.054	5.458	.008[c]
	Residual	556.700	44	12.652		
	Total	694.809	46			
3	**Regression**	192.193	3	64.064	5.481	.003[d]
	Residual	502.616	43	11.689		
	Total	694.809	46			

[a] Dependent Variable: PMMA Tonal Posttest

[b] Predictors: (Constant), Pop Favorite Genre

[c] Predictors: (Constant), Pop Favorite Genre, Singing Favorite Music Activity

[d] Predictors: (Constant), Pop Favorite Genre, Singing Favorite Music Activity, Control – Voice/Instruments/Voice & Instruments

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficient		
		B	**Std. Error**	**Beta**	**t**	**Sig.**
1	**(Constant)**	25.361	.618		41.033	.000
	Pop Favorite Genre	3.003	1.278	.331	2.350	.023
2	**(Constant)**	25.953	.650		39.917	.000
	Pop Favorite Genre	3.379	1.237	.372	2.731	.009
	Singing Favorite Music Activity	-2.662	1.201	-.302	-2.216	.032
3	**(Constant)**	26.186	.634		41.285	.000
	Pop Favorite Genre	3.333	1.189	.367	2.802	.008
	Singing Favorite Music Activity	-2.643	1.155	-.300	-2.289	.027
	Control – Voice/Instruments/ Voice & Instruments	.714	.332	.279	2.151	.037

[a] Dependent Variable: PMMA Rhythm Posttest

Regression formula Model 1: 3.003Pop + 25.361
Regression formula Model 2: 3.379Pop – 2.662Singing + 25.953
Regression formula Model 3: .714Control – 2.643Singing + 3.333Pop + 26.186

Results indicated that preference for singing as a favorite music activity was a significant, negative predictor for PMMA rhythm scores. In the first model, the Adjusted R Square indicated that preference for singing as a favorite music activity accounted for 9.0% of the variance in the PMMA rhythm mean scores [F (1,45) = 5.523, $p < .05$]. Preference for the pop genre was a significant, positive predictor for PMMA rhythm scores. In the second model, the Adjusted R Square indicated that preference for the pop genre accounted for 16.2% of the variance in the PMMA rhythm mean scores [F (2,44) = 5.458, $p < .05$]. Compared to the three experimental groups, the control group was a

significant, positive predictor for PMMA rhythm scores. In the third model, the Adjusted R Square indicated that the control group, as compared to the three experimental groups, accounted for 22.6% of the variance in the PMMA rhythm mean scores [F (3,43) = 5.481, $p < .05$]. Preference for singing as a favorite activity was associated with lower PMMA rhythm scores (*Beta* = -.302, $p < .05$). Preference for the pop genre (*Beta* = .331, $p < .05$) and the control group, as compared to the three experimental groups (*Beta* = .279, $p < .05$) were both associated with higher PMMA rhythm scores. In other words, students who preferred singing as a favorite activity were more likely to perform poorly on the PMMA rhythm discrimination test, whereas students who preferred pop music were more likely to perform better on the test. In addition, participants in the control group were more likely to perform better on the PMMA rhythm test than were the participants in the other groups.

Stepwise multiple regression analyses were conducted to determine whether there were significant relationships among music experience, music activity preference, and the PMMA composite posttest scores. Pearson Product-Moment Correlations were calculated to determine whether there were significant correlations between the *Primary Measures of Music Audiation* (PMMA) composite posttest scores and the four groups, the six music experience variables, the eight music preference variables, and the seven music activity preference variables (see Table 22).

Table 22

Pearson Product-Moment Correlations among Music Experience, Music Preference, and Music Activity Preference for Primary Measures of Music Audiation (PMMA) Composite

Variable	Composite Posttest P. Correlation	Sig.
Group Contrasts:		
Control – Voice/Instruments/Voice & Instruments	.266	.036*
Voice – Instruments/Voice & Instruments	.020	.446
Instruments – Voice & Instruments	.051	.366
Music Experience:		
Singing and Playing Instruments	-.021	.444
Extent of Singing and Playing Instruments	-.066	.330
Music Lessons	-.142	.170
Extent of Music Lessons	-.155	.149
Family Sings at Home	.243	.050
Family Plays Instruments at Home	.137	.180
Music Preference:		
Listens to Music Outside School	-.080	.297
Pop Favorite Genre	.365	.006*
Country Favorite Genre	-.010	.474
Rock Favorite Genre	.022	.441
Jazz Favorite Genre	-.397	.003*
Classical Favorite Genre	.072	.314
Gospel Favorite Genre	.063	.338
Other Favorite Genre	-.193	.097
Favorite Music Class Activity:		
Singing	-.060	.344
Playing Instruments	.101	.250
Reading Music Notation	-.059	.348
Composing	.	.000**
Talking about Music	.	.000**
Listening to Music	-.138	.177
Dancing/Moving	.119	.213

* $p < .05$

**Composing and Talking about Music variables had no student responses in the questionnaire

While the "control – voice/instruments/voice & instruments" group contrast and "pop" genre variables had small, positive correlations with the PMMA composite posttest scores, and the "jazz" genre variable had a small, negative correlation, only "pop" and "jazz" were significant predictors for the composite scores (see Table 23).

Table 23

Multiple Regression for Primary Measures of Music Audiation (PMMA) Composite

Model Summary[c]

	R	R Square	Adjusted R Square	Std. Error of the Estimate
Model 1	.397[a]	.158	.139	5.78691
Model 2	.504[b]	.254	.220	5.50670

[a] Predictors: (Constant), Jazz Favorite Genre

[b] Predictors: (Constant), Jazz Favorite Genre, Pop Favorite Genre

[c] Dependent Variable: PMMA Composite Posttest

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	**Regression**	282.129	1	282.129	8.425	.006[b]
	Residual	1506.977	45	33.488		
	Total	1789.106	46			
2	**Regression**	454.864	2	227.432	7.500	.002[c]
	Residual	1334.242	44	30.324		
	Total	1789.106	46			

[a] Dependent Variable: PMMA Composite Posttest

[b] Predictors: (Constant), Jazz Favorite Genre

[c] Predictors: (Constant), Jazz Favorite Genre, Pop Favorite Genre

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficient		
		B	**Std. Error**	**Beta**	**t**	**Sig.**
1	**(Constant)**	60.023	.872		68.801	.000
	Jazz Favorite Genre	-10.023	3.453	-.397	-2.903	.006
2	**(Constant)**	58.879	.959		61.422	.000
	Jazz Favorite Genre	-8.879	3.321	-.352	-2.674	.010
	Pop Favorite Genre	4.576	1.917	.314	2.387	.021

[a] Dependent Variable: PMMA Composite Posttest

Regression formula Model 1: -10.023Jazz + 60.023

Regression formula Model 2: -8.879Jazz + 4.576Pop + 58.879

Results indicated that preference for the jazz genre was a significant, negative predictor for PMMA composite scores, while pop genre preference was a significant, positive predictor. In the first model, the Adjusted R Square indicated that preference for the jazz genre accounted for 13.9% of the variance in the PMMA composite mean scores [F (1,45) = 8.425, $p < .05$]. In the second model, preference for the pop genre was added and the Adjusted R Square became .220. Results indicated that preference for the pop genre accounted for 22.0% of the variance in the PMMA composite mean scores [F (2,44) = 7.500, $p < .05$]. Preference for the jazz genre was associated with lower PMMA composite scores (*Beta* = -.397, $p < .05$), while preference for the pop genre was associate with higher PMMA composite scores (*Beta* = .314, $p < .05$). In other words, students who preferred jazz music were more likely to have lower PMMA composite scores, whereas students who preferred pop music were more likely to have higher composite scores.

Summary

To address the secondary research questions, the Music Experience/Music Activity Preference Questionnaire was analyzed by calculating the frequency of positive responses in each possible answer. Percentages of each response were obtained in reference to the number of participants in each group, as well as to the total number of participants who completed the questionnaire.

Stepwise multiple regression analyses were conducted to determine whether there were significant relationships among the extent of music experience, preference for music activities, and the PMMA posttest scores. Results indicated that preference for jazz and

the genre labeled "other" (i.e., rap, hip-hop, and "Kidz Bop") were small, but negative predictors for PMMA tonal scores. Preference for "singing" as a favorite music activity was a small, negative predictor for PMMA rhythm scores, and preference for the pop genre was a small, positive predictor for PMMA rhythm scores. Jazz genre preference was a small, negative predictor for PMMA composite scores, while pop genre preference was a small, positive predictor. The control group, as compared to the three experimental groups, was a small, positive predictor for PMMA rhythm scores only.

Research Question 5

What are the preferences of second-grade students for music class activities and performances?

Student Interviews

To address Research Question 5, interviews were conducted with selected participants regarding their responses to some of the questions from the Music Experience/Music Activity Preference questionnaire. After the questionnaire was administered to participants in September 2015 during each group's music class period, I randomly selected students to interview about some of their questionnaire responses. These students were chosen from participants who completed the questionnaire and were willing to talk with me about their responses. After initially choosing two randomly-selected students from each group to be interviewed, three additional students volunteered to participate in interviews with me, for a total of 11 students. Interviewed participants were from the following groups: Group A (n = 2), Group B (n = 2), Group C (n = 3), Group D (n = 4). I interviewed a total of five male participants and six female

participants. Each one-on-one interview was conducted in the office of the school's music teacher, located next door, and lasted approximately 15 minutes. The interviews took place from October 13, 2015 to November 13, 2015. I used a prepared set of Music Experience/Music Activity Preference Questionnaire follow-up interview questions (see Appendix B) to investigate the reasons behind the participants' responses in the "In-Class Music Activity Preferences" section of the questionnaire. When appropriate, I asked additional questions to clarify participants' responses during the interview.

Several common themes emerged throughout the interviews, which helped to illustrate some of the reasons for the participants' responses about their music activity preferences: (a) social/performance anxiety, (b) musical choices, (c) music and family, and (d) music and expression. To protect anonymity, all names are pseudonyms of the actual participants who were interviewed.

Social/Performance Anxiety

Many of the participants who indicated on the questionnaire that they did not like to sing, talk about music, improvise or compose, or dance or move in music class, explained during the interviews that they felt shy or embarrassed doing those activities in class. Some participants expressed that they liked those activities, but were reluctant to participate during music class because of how others might perceive them.

Amanda responded that she liked to sing in music class, but would rather sing with the whole group while at school. Amanda said, "I like how we get to sing together and I like to sing. I sing by myself at home sometimes. I like singing with all the groups. I get embarrassed easily." She enjoyed singing by herself at home, but was reluctant to

sing by herself at school. Carla also said she liked to sing in music class, but preferred singing as a group. She said, “When I sing with everyone, with the class, it sounds much more prettier.” Carla responded that she did not like talking about music, or dancing or moving to music in music class because she worried that her classmates would laugh at her. She told me that she liked hip-hop music and did not want to talk about music in class because she said, “I really don't think they like my songs [hip-hop] 'cause they might laugh.” Carla felt “scared and embarrassed” about dancing or moving to music in music class because she was worried her classmates might laugh at her movements. Lucy was enthusiastic about singing in music class and said she liked singing because “when I sing I feel like there is nothing that can stop me.” However, she added, “When somebody makes fun of me when I sing, it doesn’t bother me.”

When I asked James why he answered “no” to the question about whether he liked to improvise and compose in music class, he said, “I just like when people sing stuff, I just like their songs. If I make a song, somebody might say that my song's not really good.” James never said that someone told him that a song he created was not “good,” but it was clear he thought that might happen. Rebecca responded that she did not like to improvise and compose in music class. She said, “If somebody doesn't know the notes and somebody tries to read and they mess up, it's really hard and that's why I don't like to do it. There's too many people. I'm shy. I get kind of scared.”

James responded that he did not like to sing in music class, but he was unsure of the reasons during the interview. Rebecca did not like to sing in music class because she said, “everybody gets loud when they sing and it hurts my ears.” Michael responded that

he did not like singing in music class because he felt shy and sometimes confused. He said, “I just don't like singing. Singing kind of makes you shy and sometimes you get sick from shyness of singing.” Nicole responded that she did not like singing in music class, although she said, “I don’t like to sing by myself but I do like to sing with the class…I get embarrassed.”

Although James, Rebecca, Michael, and Nicole responded that they did not like singing in music class, they were all enthusiastic about their preference for playing instruments. When I asked Michael if playing instruments in music class made him feel shy he said, “No, ‘cause you're just playing the instruments.” Nicole said she really enjoyed playing instruments in music class and said that her favorite instrument was the flute [which was what she called a recorder]. Although they do not play recorders in her music class, she indicated that she enjoyed playing melodies on the xylophone. She added, “I want to be a music teacher one day.” Even though Nicole felt embarrassed to sing in music class, she felt comfortable playing instruments. Her enjoyment of playing instruments contributed to her overall feeling about music, in that she aspired to be a music teacher.

Musical Choices

Many of the participants I interviewed mentioned preferences for instruments they do not have the opportunity to play in their music class. Some participants who responded that they did not prefer an activity, such as singing or improvising and composing, indicated that they liked doing those activities at home but not in school;

some said that they would like doing the activities in school if different songs were sung or different instruments were available.

Tim said, “I have a trumpet at home…We don't play instruments in music class, well we sort of do. I don't like the ones that are over here because there's only those xylophones and I don't like playing those.” When I asked Tim, “What if there were trumpets to play in music class,” he said, “I would love it.” When asked why he responded that he did not like improvising or composing in music class, Tim said that he did not know what he should write down. Since he spoke about practicing and performing music at home, I asked him if he liked improvising and composing music at home. Tim said,

> I do. I have more experience…I like to make different words, new words…I can't really do nothing in music class. I just don't like doing that…I do want to like it, but I want to do it the way that somebody tells me to do it. Like my brothers or my mom to tell me what to write 'cause I don't know what to write.

When I asked Amanda why she liked playing instruments, she said,

> I like flutes [recorders] but we don’t really get to do that in music class…Playing instruments is fun. Singing is just using your voice and you can drum on the drums and that's funner than singing. The flute [recorder] is my favorite. In music class my favorite is the drums. I like it because sometimes you get to play the drums hard and I really like to play the drums hard.

When I asked Sam why he responded that he did not like singing in music class, he said:

> I kind of like it, I just don't like it that much. Sometimes I like making noises with my mouth. I do like whistling-singing at home. I just think I don't really like it because you have to sing certain songs, I mean, you don't get to choose your songs. If I could choose my own songs, my answer would be yes [that he likes to sing in class]. I kind of make up my own songs, like yesterday I made up my own song, it's called 'I'm Never Going Back.' It's kind of a sad song. It's about someone who's not going back to his old life because of what happened to him. But it doesn't say what happened to him in the song until the end. I haven't got the whole thing planned. I only got like half the song planned.

Sam also responded that he did not like playing instruments in music class. When I asked him why, he said, "I like playing instruments, but not that kind of instruments." I asked him what kind of instruments he would like to play, and he said, "Maybe a guitar or something. Maybe a drum set." When I asked Nicole to tell me her favorite instrument to play in music class, she said, "My favorite instrument is the flute [recorder]. I have one of those instruments at home." She said they did not play those in music class, but that she also liked the xylophone because she could play melodies on it. Nicole also said that she did not like improvising and composing in music class. When I asked her if she had done those activities in music class, she said, "No, not really. I haven't done it yet. I like to make up music at home." Since she indicated that she liked to create music at home, I asked her if she thought she would like doing that activity in music class. She said, "Yeah, I would."

Michael said, "When I grow up, I'm gonna start playing the guitar and drums. In music class I kind of like to play rhythm sticks and glockenspiels and if you ever get drums or something like that [drum set], I would like that too." He preferred rock music and really was not interested in types of music that did not at least sound similar to the

rock genre. When I asked him why he responded that he did not like improvising and composing music, he said, “Making up music, it's kind of freaky to me. And writing down music, it sounds like a lot of work. Sometimes it takes me a long time and sometimes I think it's not good enough.” When I asked him if he would feel differently about those activities if he could use pictures instead of traditional music notation, he said, “That would be a little better. ‘Cause I am a good artist.”

Kenny told me that he liked to improvise and compose, but “I don't do it as much in music class. But in my head I like to, in my head I like to make up different words.” He said that if he were able to make up songs like that in music class, he would like it. Jennifer said that she enjoyed listening to music in music class, but wished she could listen to different music and dance the way she wanted to dance. She said, “I love listening to music. It makes me dance but I can't dance to music in music class and I don't like that 'cause they don't let me dance.” Jennifer said, “The 'whip' [a popular dance] is my jam, but I don't get to do that in music.” Activities centered around popular music were clearly preferred by many of the participants.

Music and Family

For some participants, musical experiences at home and family members who sing or play instruments were often factors that influenced their preferences for music class activities. These experiences were often mentioned first when I asked participants about their responses to the questions about activities in music class. Instruments that were played or music activities that occurred at home had both positive and negative influences toward the way they felt about some music class activities.

Jennifer told me she liked singing in music class because "my family, they listen to a lot of music, so my stepmom listens to music and she used to teach me and my mom used to play music." When I asked Jennifer to tell me why she liked playing instruments in music class she told me about her great-great-grandfather who used to play music, and about her dad who plays guitar and piano sometimes. She added, "The best instruments would be, let's see, the piano or the drums. Or guitar because I know how to do that." Jennifer responded that she liked the xylophone and the drums in music class, but it was clear that the instruments her family members played were her preference.

Tim responded that he did not like to improvise and compose music in music class, mostly because he relied on his mother and brother to help him know what to write. He said,

> I can't really do nothing in music class. I just don't like doing that. I do want to like it, but I want to do it the way that somebody tells me to do it. Like my brothers or my mom to tell me what to write 'cause I don't know what to write.

He told me that he did not like listening to music in music class because they did not really listen to music anymore. As he spoke, he explained that they actually did listen to music, but it was not his preferred type of music. When I asked him what kind of music he preferred, he told me he liked the songs "Jingle Bells" and "Feliz Navidad." He mentioned that he and his family would often play songs at home in both English and Spanish, especially at family gatherings such as cookouts in their yard. Tim also responded that his favorite music class activity is learning to read music notation,

although he said, “At home, it's really easy but here it's hard. At home, there's some instruments I know how to play, but not here.”

Carla told me that she sang at home with her sister. When I asked her to tell me what she liked about improvising and composing in music class, she first began talking about the things she did at home. She said, “I like writing down music because that way I'm not bored and I can kind of play and sing all the day with the songs I make. Me and my sister can sing them.” Carla added that she liked to create songs in music class as well, but the fact that she emphasized her activities at home suggests that her positive attitude toward composing in music class may be related to her positive attitude toward composing at home.

Music and Expression

Several of the students I interviewed indicated that music was a way for them to express their thoughts and emotions. Unlike some other subject areas in elementary school, such as math or social studies, music has more freedom for individual expression and creativity. Students who may struggle to achieve in other subject areas, may feel successful in the music classroom. The opportunity to express themselves in music class may lead to more positive attitudes toward music in general.

When asked to explain why he likes dancing and moving in music class, Michael said,

> Moving, you get to run around and stuff like that, it's fun. And dancing, you get to show everybody all the cool moves you can do and stuff. Sitting there listening to the music, you're not really doing anything. Dancing, you're actually doing something.

Michael felt that dancing to music was a way to express himself in an active way.

When I asked Carla what she liked about improvising and composing in music class, she said, “When we're singing and she [the music teacher] makes songs, she makes pretty songs. We can sing what we want to sing, what's in our own mind, and I like that. If I don't have nothing to do, I can do that.” When I asked her why she liked playing instruments, she said, “In first grade, one time when we were playing the xylophone, when you're playing you can kind of sing in your mind with the xylophone.” For Carla, creating songs through singing and playing instruments was a way to express what she heard in her mind.

Kenny told me that the drums were his favorite instruments to play in music class because he could use them to express how he felt. He said, “Sometimes they get loud and soft…I can be quiet or I can be loud.” Kenny added, “sometimes it feels like when I'm angry if I can play an instrument I'll kind of feel better.” James responded that dancing and moving was his favorite music activity and said, “I like moving so I can like make new dances and it makes me feel happy and when it's the next person's song it makes them feel happy. It makes me feel great.” Kenny and James liked being able to express how they felt through different musical activities.

Lucy responded positively to all the music activity preference questions and she felt that music was an outlet for expression for her. When asked why she liked singing in music class, she said, “Because when I sing I feel like there is nothing that can stop me.” She also said that she liked improvising and composing in music because “it feels my expression and it shows who I am.” Lucy said she liked dancing and moving to

music in music class because “Well when I dance I feel like I’m freeing myself… It don’t bother me when I dance. I just feel like no one’s gonna break me from that.” When asked why she liked listening to music in music class, she said, “I feel like when I listen to music inside I feel happy. It makes my heart feel happy.” Lucy expressed herself through a variety of music activities and has positive attitudes toward all the music class activities in the questionnaire.

Summary

Through the interviews conducted with these second-grade students, I gained insight into the preferences of second-grade students for music class activities and performances, which helped to reveal some of the reasons for the participants’ responses about their music activity preferences. Some participants experienced feelings of anxiety toward certain activities, while others simply did not like the types of music or musical instruments that were available in music class. For some participants, the music they heard or played at home influenced their perceptions of music in the classroom, and many of the participants who expressed positive attitudes toward activities indicated personal expression as one of the reasons.

Many participants indicated that they liked certain music activities, such as singing or dancing, but the fear of embarrassment created negative attitudes toward those activities in the context of music class. Activities involving personal expression, such as singing and dancing, were sources for anxiety, while activities that incorporated other elements, such as playing instruments, did not have negative connotations. This suggests

that the activity of playing instruments may be a better mode of presentation for learning for some students.

Some participants expressed the desire to sing different types of music or play different instruments in music class. There may be a disconnect for some students between the way they view music in the classroom versus outside of school. In viewing music as two separate entities, students may have trouble relating to their musical experiences. For some participants, their musical experiences at home affected their attitudes of music activities in the classroom. Students may be drawn to certain instruments and genres (e.g., popular music) that they see and hear role models outside of school perform or discuss. If the instruments or genres of music that students prefer are not those experienced in the elementary music class, students may develop negative attitudes toward music class activities. Musical experiences outside of school and in the music classroom were indicated as sources of personal expression for many participants. Many types of music class activities were mentioned as means of expression for participants, which suggests that a variety of activities should be incorporated into elementary music lessons in order to meet the needs of different learners.

CHAPTER V

DISCUSSION

The primary purpose of this quasi-experimental study was to investigate the effect of aural instruction with tonal and rhythm patterns from Edwin Gordon's Music Learning Theory on the tonal and rhythmic discrimination abilities across four groups of second-grade students. Each intact second-grade class was assigned randomly to one of four groups: (a) Group A: no pattern instruction (control group), (b) Group B: pattern instruction using instruments only, (c) Group C: pattern instruction using singing and chanting only, and (d) Group D: pattern instruction using singing, chanting, and playing instruments. Primary research questions associated with the present study included:

1. Is there a significant main effect of aural instruction with Edwin Gordon's tonal and rhythm patterns in music learning theory on the tonal discrimination abilities across the four groups of second-grade students?
2. Is there a significant main effect of aural instruction with Edwin Gordon's tonal and rhythm patterns in music learning theory on the rhythmic discrimination abilities across the four groups of second-grade students?

The secondary purpose of this study was to determine whether there was a relationship among the extent of music experience, music activity preference, and the tonal and rhythmic discrimination abilities across the four groups of second-grade students. Secondary research questions associated with the present study included:

3. Is there a relationship among the extent of music experience, preference for music activities, and the tonal discrimination abilities across the four groups of second-grade students?
4. Is there a relationship among the extent of music experience, preference for music activities, and the rhythmic discrimination abilities across the four groups of second-grade students?
5. What are the preferences of second-grade students for music class activities and performances?

Participants were four intact second-grade general music classes from one elementary school in North Carolina. The classes were assigned randomly to three experimental groups and one control group. I instructed the experimental groups using Edwin Gordon's aural-based tonal patterns in Music Learning Theory for ten minutes each class period during a treatment week and rhythm patterns the next treatment week. The experimental groups were assigned randomly to one of three conditions: (a) playing instruments only, (b) singing and chanting only, and (c) singing, chanting, and playing instruments. The control group did not receive tonal and rhythm pattern instruction; instead, I instructed participants for ten minutes each class period using classroom activities from the *Spotlight on Music* second-grade textbook series. At the beginning of the study, all participants were administered the *Primary Measures of Music Audiation* (PMMA) to measure their developmental music aptitude. Participants were administered a researcher-created questionnaire to determine the extent of their musical experience and their music activity preferences. Some students were selected at random to be

interviewed by me to provide additional information about their questionnaire responses. At the end of the study, all participants were administered the PMMA as a posttest. The research study period was August 31 – December 16, 2015, with twelve weeks allotted for the instructional treatment period.

To control for teacher bias, lessons taught by me were video recorded and reviewed to evaluate teaching consistency across all groups. Three licensed music teachers certified in Music Learning Theory were selected and trained by me to review and evaluate the recorded lessons. Using procedures and forms based on those suggested by Madsen and Madsen (1998), the trained observers checked for any inconsistencies of teacher approval or disapproval of students' academic and social behaviors during the lessons. At the end of the training sessions, an interobserver reliability coefficient of 0.82 was obtained, which indicated that the reliability of the observers was acceptable (Madsen & Madsen, 1998).

After completing the training sessions, the three observers evaluated 12 additional randomly-selected lessons (three from each of the four groups). Using the same procedures that were used during the training sessions, the observers evaluated the lessons for any inconsistencies of teacher approval or disapproval of students' academic and social behaviors. The observers' academic and social approval and disapproval evaluations were averaged for each observed lesson and means were compared across the instructional groups. Combined academic and social approval means for the groups were as follows: Group A (16.3), Group B (15.4), Group C (15.5), and Group D (15.1). Combined academic and social disapproval means for the groups were as follows: Group

A (0.2), Group B (0.7), Group C (0.1), and Group D (1.1). These results indicated that consistency of teacher approval and disapproval of students' academic and social behaviors across instructional groups had been established.

Summary of Results

To address the primary research questions, an Analysis of Covariance (ANCOVA) procedure was performed, using the pretest scores of each subtest as the covariates, to determine whether there were any significant main effects or interaction effects of instruction. Descriptive statistical analyses were conducted to determine measures of central tendency.

The means for the PMMA tonal, rhythm, and composite pretest and posttest scores were examined within each group. All groups showed gains from the pretest to the posttest mean scores on the PMMA tonal subtest; however only Groups A (control), C (voice), and D (instruments and voice) showed gains on the PMMA rhythm mean scores and the composite mean scores. The mean scores for Group B (instruments) decreased from the pretest to the posttest on the PMMA rhythm subtest and the composite scores. Results of the ANCOVA analyses indicated there were no significant main effects or interaction effects of instruction for any of the PMMA subtests at the .05 level of significance.

To address the secondary research questions, the researcher-created Music Experience/Music Activity Preference questionnaires were analyzed by calculating the frequency of positive responses in each possible answer. Percentages of each response were obtained in reference to the number of participants in each group, as well as to the

total number of participants who completed the questionnaire. Pearson Product-Moment Correlations were calculated to determine whether there were significant correlations between the *Primary Measures of Music Audiation* (PMMA) posttest scores and the four groups, the six music experience variables, and the fifteen music/music activity preference variables. Stepwise multiple regression analyses were conducted to determine whether there were significant relationships among music experience, music activity preference, and the PMMA posttest scores.

Results indicated that preference for jazz and the genre labeled "other" (i.e., rap, hip-hop, and "Kidz Bop") were small, negative predictors for PMMA tonal scores. Preference for singing as a favorite music activity was a small, negative predictor for PMMA rhythm scores, and preference for the pop genre was a small, positive predictor for PMMA rhythm scores. Jazz genre preference was a small, negative predictor for PMMA composite scores, while pop genre preference was a small, positive predictor. The control group, as compared to the three experimental groups, was a small, positive predictor for PMMA rhythm scores. Based on the results of the analyses, aural instruction with tonal and rhythm patterns from Edwin Gordon's Music Learning Theory did not have a significant effect on the tonal and rhythmic discrimination abilities of second-grade students.

Discussion

Research Questions 1 and 2

The primary purpose of this study was to investigate the effect of aural instruction with tonal and rhythm patterns from Edwin Gordon's Music Learning Theory on the

tonal and rhythmic discrimination abilities across four groups of second-grade students. Results of data analyses indicated there were no significant main effects or interaction effects of instruction for any of the PMMA subtests at the .05 level of significance. While all of the groups showed mean score increases from the pretest to the posttest on the PMMA tonal subtest, Group B (instruments group) was the only group that showed a decrease in mean scores for the PMMA rhythm subtest and composite scores. In addition, Group B's mean score increase from pretest to posttest on the PMMA tonal subtest was nonsignificant ($p > .05$), while the mean increases of the other groups on that subtest were significant ($p < .05$). Due to a non-participant parental concern, I taught lessons with Group B in the school's auditorium, while the regular music teacher taught the non-participants next door in the music room. Given that Group B was smaller in size than the other total class sizes, one might assume that they had the potential to be more focused during lessons. Since the other groups received instruction from me in the music room along with their non-participant classmates, it is possible that the environmental change affected their ability to learn. In addition, school closure due to a holiday prevented me from instructing Group B for one rhythm lesson, meaning that Group B only received instruction for 11 of the 12 total lesson weeks. Since tonal and rhythm pattern instruction was given in alternating weeks, Group B received 6 tonal pattern lessons and 5 rhythm pattern lessons. These factors may have disrupted the efficacy of instruction for Group B, resulting in overall lower PMMA scores.

Participants in Group D (instruments and voice group) showed the highest increase on their mean tonal scores with a mean difference of 5.18. Participants in Group

A (control group) showed the next highest increase of mean tonal scores with a mean difference of 3.55. All groups showed smaller mean differences on the rhythm scores, with Group A (control group) exhibiting the highest increase with a mean difference of 2.55. Participants in Group C (voice group) showed the next highest increase in mean rhythm scores with a mean difference of 2.00. For the PMMA composite scores, Group A (control group) showed the highest increase on their mean scores with a mean difference of 6.11. Participants in Group D (instruments and voice group) showed the next highest increase with a mean difference of 5.47, and Group C (voice group) had a slightly lower mean difference of 5.17. Participants in Group B (instruments group) exhibited the only decrease in mean scores with a mean difference of -1.73 on their composite mean scores.

Regardless of the slight differences in mean scores of the groups from pretest to posttest, ANCOVA analyses indicated there were no significant main effects or interaction effects of instruction. The nonsignificant results obtained were not surprising given the small sample size, and low statistical power and effect sizes. It is possible that ten minutes of music pattern instruction per week, without additional reinforcement during the remainder of each music class period, was insufficient to produce significant differences among the groups. Additionally, since tonal and rhythm pattern instruction alternated each week, the treatment groups received a total of only one hour of tonal and rhythm pattern instruction each. The posttest mean scores for each of the PMMA subtests across all groups were similar, which indicates no one instructional method was better than another regarding tonal and rhythmic discrimination abilities.

Research Questions 3 and 4

The secondary purpose of this study was to determine whether there was a relationship among the extent of music experience, music activity preference, and the tonal and rhythmic discrimination abilities across the four groups of second-grade students. Results of the stepwise multiple regression analysis for the PMMA tonal subtest indicated that students who preferred jazz and the genre labeled "other" (i.e., rap, hip-hop, and "Kidz Bop") were more likely to perform poorly on the PMMA tonal subtest. Only three participants (6%) chose jazz as their preferred music genre and this variable accounted for only 13.9% of the variance of the PMMA tonal mean scores. While analysis indicated that preference for the jazz genre was a significant predictor of lower tonal mean scores ($p < .05$), this preference only accounted for a small amount of variance and had a small, negative correlation with the PMMA tonal scores ($r = -.232$, $p < .05$), which indicated a weak relationship. The genre variable "other" earned the highest preference percentage with a total of fourteen participants (28%), and accounted for 21.4% of the variance of the PMMA tonal mean scores. While the genre variable "other" accounted for more variance than did the jazz genre variable, the percentage was still relatively small. In addition, the genre variable "other" had a small, negative correlation with the PMMA tonal scores ($r = -.232$, $p < .05$), which indicated a weak relationship. While these variables were statistically significant predictors in the regression models, none of the variables accounted for substantial portions of the variance of the PMMA tonal mean scores and all had weak relationships with the scores.

Results of the stepwise multiple regression analysis for the PMMA rhythm subtest indicated that students who preferred singing as a favorite music activity were more likely to perform poorly on the PMMA rhythm subtest, while students who belonged to the control group or preferred the pop genre were more likely to perform better on the subtest. Although 24% of participants preferred singing as a favorite music activity, this preference only accounted for 9% of the variance of PMMA rhythm mean scores and had a small, negative correlation with the scores (r = -2.51, p < .05), which indicated a weak relationship. Preference for the pop genre (24% of participants) accounted for 16.2% of the variance of the PMMA rhythm mean scores and had a small, positive correlation with the scores (r = .331, p < .05), which indicated a weak relationship. The control group, as compared to the other groups, accounted for 22.6% of the variance of the PMMA rhythm mean scores and had a small, positive correlation with the scores (r = .287, p < .05), which indicated a weak relationship. It is possible that students in the treatment groups did not have enough time to assimilate the unfamiliar rhythm pattern syllables, which resulted in their lower performance on the PMMA rhythm subtest. This might account for the apparent higher rhythm scores from the control group. While these variables were statistically significant predictors in the regression models, none of the variables accounted for substantial portions of the variance of the PMMA rhythm mean scores and all had weak relationships with the scores.

Results of the stepwise multiple regression analysis for the PMMA composite scores indicated that students who preferred the jazz genre were more likely to have lower PMMA composite scores, while students who preferred the pop genre were more

likely to have higher composite scores. Preference for the jazz genre accounted for only 13.9% of the variance of the PMMA composite mean scores and had a small, negative correlation with the scores (r = -.397, p < .05), which indicated a weak relationship. Preference for the pop genre accounted for 22% of the variance of the PMMA composite mean scores and had a small, positive correlation with the scores (r = .365, p < .05), which indicated a weak relationship. While these variables were statistically significant predictors in the regression models, none of the variables accounted for substantial portions of the variance of the PMMA composite mean scores and all had weak relationships with the scores.

The results of the multiple regression analyses indicated that the jazz genre, the genre labeled "other," the pop genre, "singing" as a favorite music activity, and the control group (as compared to the other groups) were statistically significant predictors (positive or negative) in the regression models; however, none of the variables accounted for considerable amounts of the variance of the PMMA mean scores and all had weak relationships with the scores. The results of this study suggest that these variables can affect PMMA scores, but only to a small extent.

Research Question 5

To answer Research Question 5, interviews were conducted with selected participants regarding their responses to some of the questions from the Music Experience/Music Activity Preference questionnaire. I selected a total of 11 participants at random to interview to provide additional information about their questionnaire responses. These interviews were transcribed and analyzed to find themes that would

provide an opportunity to better understand the reasons for the participants' responses. The themes that emerged from the interviews were: (a) social/performance anxiety, (b) musical choices, (c) music and family, and (d) music and expression.

Based on participant interviews, music activities that were viewed as personal expressions (i.e., singing and dancing) were more likely to create feelings of anxiety for students about participating in those activities during music class. Playing instruments was not a source of anxiety for the participants interviewed, which suggests that having a physical object as a medium for the music reduces the risk of embarrassment in the participants' minds. While many students liked music class activities, their social and performance anxiety about participating in certain activities in music class (i.e., singing and dancing) created negative attitudes toward the activities. Some participants viewed music in school as completely separate from music outside of school, which could create negative feelings toward music class activities. The desire to sing popular music or play instruments used in popular music (i.e., guitars or drum sets) was indicated by several participants, which connects with the large percentage of participants who preferred popular music genres (e.g., rap, hip-hop, pop). Musical experiences at home and with family members affected how some participants viewed music class activities, especially when the type of music or instruments played at home differed from what was played in music class. Many participants felt that music was a way to express themselves, both outside of school and in the music classroom. A variety of music activities, different genres of music, and different types of instruments should be incorporated into

elementary music lessons to provide students with a broad array of music experiences within a safe classroom environment.

Limitations of the Study

This quasi-experimental study took place from late August to December, with twelve weeks allotted for instruction. Due to the nature of the music class schedule at the elementary school used in this study, I met with each class once a week. Although I was able to maintain this schedule for three of the groups, school closure for a holiday prevented me from instructing Group B (instruments group) during one week. Following the recommendations of Gordon (2001), tonal and rhythm patterns were instructed on an alternating basis so that tonal patterns were taught one time per week for ten minutes and rhythm patterns were taught once the following week for ten minutes. Because of my alternating tonal and rhythm pattern instruction, Group B received one fewer rhythm pattern lessons than did the other experimental groups due to the school holiday. While Group B performed lower overall on the PMMA and showed a decrease in mean scores on the tonal and composite scores, ANCOVA analyses indicated there were no significant main effects or interaction effects of instruction among the four groups on any subtests of the PMMA. These results suggest that an average of six ten-minute lessons of tonal pattern instruction and six ten-minute lessons of rhythm pattern instruction are not sufficient to make a significant difference in the tonal and rhythmic discrimination abilities of second-grade students. A longer instructional period or more frequent lessons might have yielded different results. Students may have had difficulty retaining information from the tonal and rhythm pattern lessons due to the alternating sequence of

instruction, especially since the skills and concepts from those lessons were not reinforced during instruction with the regular music teacher.

Participant fatigue or lack of motivation may have affected the results of the PMMA posttest scores, since the posttest was given to participants in December within the last week of school prior to winter break. Participants may have been distracted by thoughts of their upcoming vacation from school, or by class parties and other special events that were held during the month.

Steps were taken to control for teacher bias by having lessons taught by me video recorded and reviewed by three licensed music teachers to evaluate teaching consistency across all groups. Since an elementary general music teacher certified in Music Learning Theory was not available for this study, I was the instructor for all of the groups. Although I earned Elementary General Music Level One certification from the Gordon Institute of Music Learning in July 2015, I did not have previous experience teaching Edwin Gordon's tonal and rhythm patterns in the elementary music classroom. Prior to this study, I taught elementary general music in the public schools for twelve years, so I was an experienced teacher of elementary general music. It is possible that instruction was not as effective as it could have been, if an experienced, certified Music Learning Theory elementary general music teacher had taught the experimental groups. If two teachers had been utilized as instructors for this study, there still may have been limitations due to differences in teaching styles. Other research studies (e.g., Rutowski, 1996; Shuler, 1991) have faced issues of effectiveness regarding teacher instruction. Due to the nature of conducting research studies in schools, variances in human behavior are

inevitable factors with which to contend. Using methods to control for teacher bias, such as having trained reviewers evaluate lessons, is an effective way to balance issues of teacher instruction when conducting research in educational environments.

Conclusions

There are many approaches and methods used in music education today and there is no consensus among music educators regarding the most beneficial approach. While the idea of sound-before-sight in music instruction has been present for hundreds of years, the debate between visual and aural literacy has sometimes overshadowed this basic principle. A comprehensive understanding of music should be based on a foundation of aural experiences that lead to both aural and visual literacy. When the process of learning music is compared to learning one's own native language, the efficacy of providing a foundation of aural music experiences is logical. Since tonal and rhythm patterns can be compared to words in a language (Gordon, 2012), the use of aural music patterns can help provide a comprehensive understanding of music. While researchers have investigated the effect of singing and chanting with Edwin Gordon's tonal and rhythm patterns, and many studies have been conducted examining instrumental instruction with the use of Gordon's patterns and the sequential process of Music Learning Theory, the research literature needs further investigations of vocal and instrumental presentation modes of Edwin Gordon's tonal and rhythm patterns. Based on previous research and the findings of the current study, many elementary students have more positive attitudes toward playing instruments in music class than other music class

activities. The aim of the current study is to inform music education about the use of tonal and rhythm pattern instruction through different presentation modes.

Based on the results of the ANCOVA analyses, there were no significant main effects or interaction effects of instruction across the groups on the PMMA scores. While PMMA mean score differences from pretest to posttest were generally positive, there were no significant differences among the posttest scores across the groups. Based on the analyses, aural instruction with tonal and rhythm patterns from Edwin Gordon's Music Learning Theory did not have a significant effect on the tonal and rhythmic discrimination abilities of second-grade students, regardless of presentation mode.

Multiple regression analyses indicated that the jazz genre, the genre labeled "other" (rap, hip-hop, "Kidz Bop"), the pop genre, "singing" as a favorite music activity, and the control group (as compared to the other groups) were small, significant predictors (positive or negative) in the regression models. Although the predictors were significant, they accounted for only small portions of the variance of the PMMA mean scores and all had weak relationships with the scores. The results of the analyses suggest that the effect of these variables on aural discrimination abilities may be limited.

Data from the Music Experience/Music Activity Preference questionnaire indicated that the majority of participants (92%) liked playing instruments in music class, while only 56% liked singing in music class. Playing instruments was the favorite music class activity for 32% of participants, and singing was the favorite activity for 24% of participants. Interviews with several participants revealed that some music class activities, such as singing and dancing, were sources of anxiety due to fear of

embarrassment from peers. Playing instruments in music class was not viewed with anxiety, although several participants wanted to play instruments that were not available in the music classroom (i.e., guitars or drum sets). The participants' attitudes were more favorable overall toward playing instruments, as compared to singing in music class. These results suggest that using musical instruments during instruction may be beneficial for students and may promote positive attitudes toward music instruction. Based on the PMMA mean scores, the use of music instruments only (Group B) did not significantly improve students' tonal discrimination abilities, and students' rhythmic discrimination abilities showed an overall decrease from pretest to posttest mean scores. However, when playing instruments was combined with singing/chanting (Group D), students' tonal discrimination abilities were significantly improved and the group showed the highest positive mean difference of all the groups from pretest to posttest on the PMMA tonal subtest. Participants in Group D (instruments and voice group) showed small, nonsignificant growth from pretest to posttest mean rhythm scores, while Group B (instruments group) showed a significant decrease in mean rhythm scores. While there were no significant main effects or interaction effects of instruction across the groups on the PMMA mean scores, the results of the questionnaire and interviews suggest that a combination of playing instruments and singing may be beneficial for the development of students' positive attitudes toward music activities and to further their comprehensive understanding of music.

Recommendations for Future Research

Research literature in the area of aural music instruction and studies involving the use of Edwin Gordon's Music Learning Theory are not as extensive as other music education areas, and further research would be beneficial. The design of the current quasi-experimental study examined different presentation modes for tonal and rhythm pattern instruction. Replications of this study are recommended and should include a larger sample size of second-grade students. Third grade students who are still in the developmental music aptitude stage could be included to determine whether any music experience or activity preference changes affect their aural discrimination abilities. Future studies should use randomized selection of students, since the use of intact classes prevents the generalization of research findings.

Since the current study used a twelve-week instruction period with lessons once a week, future studies should include either a longer instruction period or more frequent lessons (e.g., lessons twice a week). It is possible that information retention could be improved if music pattern instruction occurred twice or three times per week. Gordon (2001) has recommended that music pattern instruction should last for no more than ten minutes each class period, with a maximum of three days of pattern instruction per week. It is possible that ten minutes each class period was too long for students to maintain focus and retain information. Future studies could include pattern instruction for five minutes each class period at least twice a week. Additionally, it may be beneficial to incorporate pattern recognition activities during the remainder of each music class period in order to improve retention.

Future studies should include participant interviews to further examine students' preferences and attitudes toward music class activities and performances. Interviews should be conducted to determine students' attitudes toward music class instruction as well. The researcher-created Music Experience/Music Activity Preference questionnaire used in this study was reliable (r = .76), but could be amended to reflect additional music genre choices that were suggested by participants (e.g., rap, hip-hop).

In this study, my aim was to investigate whether a short amount of aural music pattern instruction in different presentation modes affected students' aural discrimination abilities. The secondary purpose of this study was to determine whether the extent of music experience or music activity preferences affected students' aural discrimination abilities. As the importance of aural musicianship grows in recognition within music education, quantitative and qualitative research studies should continue to investigate the significance of foundational aural music experiences, aural and visual literacy, students' music genre and music activity preferences, and their music experiences outside of school.

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APPENDIX A

MUSIC EXPERIENCE / MUSIC ACTIVITY PREFERENCE QUESTIONNAIRE

Each question will be read aloud. Please circle the letter of the answer you choose.

I. Music Experience

1. Do you sing or play an instrument outside of school?

   a. Yes b. No

2. How long have you been singing or playing an instrument outside of school?

   a. More than one year b. Less than one year c. None

3. Have you ever taken music lessons outside of school?

   a. Yes b. No

4. How long have you been taking music lessons outside of school?

   a. More than one year b. Less than one year c. None

5. Does your family sing songs at home?

   a. Yes b. No

6. Does your family play musical instruments at home?

a. Yes b. No

II. Out-of-Class Music Preferences

7. Do you like to listen to music outside of school?

a. Yes b. No

8. What kind of music do you like to listen to outside of school?

a. Pop b. Country c. Rock d. Jazz

d. Classical e. Gospel f. Other_____

III. In-Class Music Activity Preferences

9. Do you like to sing in music class?

a. Yes b. No

10. Do you like to play instruments in music class?

a. Yes b. No

11. Do you like to improvise and compose in music class?

a. Yes b. No

12. Do you like to learn about composers in music class?

a. Yes b. No

13. Do you like to play music games in music class?

a. Yes b. No

14. Do you like to listen to music in music class?

a. Yes b. No

15. Do you like to learn how to read music notation (rhythms and pitches) in music class?

a. Yes b. No

16. Do you like to talk about music in music class?

a. Yes b. No

17. Do you like dancing or moving in music class?

a. Yes b. No

18. Did you participate in a music performance at school last year?

a. Yes b. No

19. Do you like participating in music performances at school?

a. Yes b. No c. Have not participated

20. Which of the following music class activities is your *favorite* (only choose ONE)?

a. Singing b. Playing Instruments c. Learning to read music notation

d. Composing e. Talking about music f. Listening to music

g. Dancing / Moving

APPENDIX B

QUESTIONNAIRE INTERVIEW PROTOCOL

In-Class Music Activity Preferences

1. Do you like to sing in music class? Why or why not?

2. Do you like to play instruments in music class? Why or why not?

3. Do you like to improvise and compose in music class? Why or why not?

4. Do you like to learn about composers in music class? Why or why not?

5. Do you like to play music games in music class? Why or why not?

6. Do you like to listen to music in music class? Why or why not?

7. Do you like to learn how to read music notation in music class? Why or why not?

8. Do you like to talk about music in music class? Why or why not?

9. Do you like dancing or moving in music class? Why or why not?

10. Did you participate in a music performance at school last year? Why or why not?

11. Do you like participating in music performances at school? Why or why not?

12. Which of the following music class activities is your *favorite* (only choose ONE)? Why?

a. Singing b. Playing Instruments c. Learning to read music notation

d. Composing e. Talking about music f. Listening to music

g. Dancing / Moving

APPENDIX C

SAMPLE LESSON PLAN:

GROUP A – CONTROL GROUP

Lesson Source: *Spotlight on Music* - 2nd Grade Textbook, p. 94 – 95

Bond, J., Leonard, H., & Macmillan/McGraw-Hill School Publishing Company. (2005). *Spotlight on music: [Grade 2]*. New York: Macmillan/McGraw-Hill.

Grade Level: 2nd Grade

Lesson Focus: Rhythm – Half Notes and Quarter Notes

National Standards (based on NAfME 1994 standards): (As indicated in Spotlight on Music, 2005, p. 94)

- 1e – Sing in groups
- 5a – Read half notes
- 6e – Move to show selected musical characteristics
- 8b – Understand how music relates to physical education
- 9b – Describe how music is used in various cultures
  (Bond, Leonard, Macmillan/McGraw-Hill, 2005, p. 94)

NC Essential Standards:

- 2.ML.2.1 Interpret rhythm patterns using standard notation for half and quarter notes, half and quarter rests, and beamed eighth notes
- 2.MR.1.1 Illustrate prominent musical characteristics or specific musical events while listening to and/or singing music
- 2.CR.1.1 Exemplify music representing the heritage, customs, and traditions of various cultures

Objectives:

- The learner will move to show half note and quarter note durations while listening to the song "Pata Pata"
- The learner will perform a dance to the song "Pata Pata"

Materials:

- CD Player
- CD of "Pata Pata" from *Spotlight on Music* 2nd Grade CD 5-16
- *Spotlight on Music* 2nd Grade Teachers Edition p. 94 - 95

- *Spotlight on Music* 2nd Grade CD-ROM to show student pages on SmartBoard

Procedures:

- Have students listen to the song "Pata Pata" while they imitate the teacher patting the beat
- Then guide them to pat the half note beat as they listen to the song
- Have them imitate the teacher to change from patting the beat in quarter note durations and then in half note durations
- Check for understanding to make sure they all can feel the difference between the two durations
- Show them the visual of the dance movements for "Pata Pata" and have all students practice with teacher (16 beat pattern)
- Have students practice by holding each movement for a half note duration
- Then have students hold each movement for a quarter note duration
- Ask them how it was different *(each movement in the quarter note duration set was held for a shorter amount of time)*
- Have students perform the movements with the song, using half note durations and then using quarter note durations

Assessment:

- Teacher will observe as students move to the music in half note durations and then at quarter note durations.
- Teacher will assess how well they make the transition between the two durations.

APPENDIX D

SAMPLE LESSON PLAN:

GROUP B – INSTRUMENTS GROUP

Lesson Source:

- Gordon, E. E. (2001). *Reference handbook for using learning sequence activities*. Chicago, IL: GIA Publications.
- Gordon, E. E. (1990a). *Jump right in: The music curriculum. Rhythm register book one.* Chicago, IL: GIA Publications.

Lesson Focus: Rhythm Unit 1, Section A, Criterion 1: Macro/Microbeats and Usual Duple Meter at the Aural/Oral level

National Standards

- 2MU:Pr4.2.2a Demonstrate knowledge of music concepts (such as tonality and meter) in music from a variety of cultures selected for performance

NC Essential Standards:

- 2.ML.1.3 Execute extended rhythmic patterns using body, instruments, or voice

Objectives:

- The learner will perform rhythm patterns in response to the teacher's performed rhythm patterns
- The learner will move to macrobeats and microbeats while chanting rhythm patterns

Materials:

- Gordon, E. E. (2001). *Reference handbook for using learning sequence activities*. Chicago, IL: GIA Publications.
- Gordon, E. E. (1990). *Jump right in: The music curriculum. Rhythm register book one.* Chicago, IL: GIA Publications.
- Rhythm Sticks

Procedures:

- The teacher will use the rhythm patterns in the Rhythm Register book one, Section A, Criterion 1

Instructions adapted from Gordon, E. E. (2001). *Reference handbook for using learning sequence activities*. Chicago, IL: GIA Publications. (p. 120 – 121).

Section A
The teacher performs the rhythm sequence on rhythm sticks in usual duple.
The teacher and students perform class patterns and individual patterns in usual duple using rhythm sticks.
The students are marked in the teaching mode and in the evaluation mode.

Criterion 1
1. Perform the rhythm sequence in usual duple using rhythm sticks.
2. Explain to the class that you are going to perform a rhythm pattern using rhythm sticks and you want them to perform the same rhythm pattern using their rhythm sticks.
3. Using rhythm sticks, perform a class pattern that is four macrobeats in length. Gesture to students when to breathe on the fourth macrobeat and then have them begin to perform the pattern on rhythm sticks on the following macrobeat.
4. Continue with individual students following the same directions. When teaching individual patterns, be sure to do both the teaching mode (performing on rhythm sticks in duet with the individual student) and then the evaluation mode (the student performing on rhythm sticks solo).
(Gordon, 2001, p. 120 – 121)

APPENDIX E

SAMPLE LESSON PLAN:

GROUP C – VOICE GROUP

Lesson Source:

- Gordon, E. E. (2001). *Reference handbook for using learning sequence activities*. Chicago, IL: GIA Publications.
- Gordon, E. E. (1990a). *Jump right in: The music curriculum. Rhythm register book one.* Chicago, IL: GIA Publications

Lesson Focus: Rhythm Unit 1, Section A, Criterion 1: Macro/Microbeats and Usual Duple Meter at the Aural/Oral level

National Standards

- 2MU:Pr4.2.2a Demonstrate knowledge of music concepts (such as tonality and meter) in music from a variety of cultures selected for performance

NC Essential Standards:

- 2.ML.1.3 Execute extended rhythmic patterns using body, instruments, or voice

Objectives:

- The learner will chant rhythm patterns using 'BAH' in response to the teacher's chanted rhythm patterns
- The learner will move to macrobeats and microbeats while chanting rhythm patterns

Materials:

- Gordon, E. E. (2001). *Reference handbook for using learning sequence activities*. Chicago, IL: GIA Publications.
- Gordon, E. E. (1990a). *Jump right in: The music curriculum. Rhythm register book one.* Chicago, IL: GIA Publications.

Procedures:

- The teacher will use the rhythm patterns in the Rhythm Register book one, Section A, Criterion 1

Instructions from Gordon, E. E. (2001). *Reference handbook for using learning sequence activities*. Chicago, IL: GIA Publications. (p. 120 – 121):

Section A
The teacher chants the rhythm sequence in usual duple using BAH.
The teacher and students chant class patterns and individual patterns in usual duple using BAH.
The students are marked in the teaching mode and in the evaluation mode.

Criterion 1
1. Chant the rhythm sequence in usual duple using BAH.
2. Explain to the class that you are going to chant a rhythm pattern using BAH and you want them to chant the same rhythm pattern using BAH.
3. Using BAH, chant a class pattern that is four macrobeats in length. Gesture to students when to breathe on the fourth macrobeat and then have them begin to chant the pattern on the following macrobeat.
4. Continue with individual students following the same directions. When teaching individual patterns, be sure to do both the teaching mode (chanting in duet with the individual student) and then the evaluation mode (the student chanting solo).
(Gordon, 2001, p. 120 – 121)

APPENDIX F

SAMPLE LESSON PLAN:

GROUP D – INSTRUMENTS AND VOICE GROUP

Lesson Source:

- Gordon, E. E. (2001). *Reference handbook for using learning sequence activities*. Chicago, IL: GIA Publications.
- Gordon, E. E. (1990a). *Jump right in: The music curriculum. Rhythm register book one.* Chicago, IL: GIA Publications

Lesson Focus: Rhythm Unit 1, Section A, Criterion 1: Macro/Microbeats and Usual Duple Meter at the Aural/Oral level

National Standards

- 2MU:Pr4.2.2a Demonstrate knowledge of music concepts (such as tonality and meter) in music from a variety of cultures selected for performance

NC Essential Standards:

- 2.ML.1.3 Execute extended rhythmic patterns using body, instruments, or voice

Objectives:

- The learner will chant and perform rhythm patterns using 'BAH' in response to the teacher's chanted and performed rhythm patterns
- The learner will move to macrobeats and microbeats while chanting and performing rhythm patterns

Materials:

- Gordon, E. E. (2001). *Reference handbook for using learning sequence activities*. Chicago, IL: GIA Publications.
- Gordon, E. E. (1990a). *Jump right in: The music curriculum. Rhythm register book one.* Chicago, IL: GIA Publications.

Procedures:

- The teacher will use the rhythm patterns in the Rhythm Register book one, Section A, Criterion 1

Instructions adapted from Gordon, E. E. (2001). *Reference handbook for using learning sequence activities*. Chicago, IL: GIA Publications. (p. 120 – 121).

Section A
The teacher chants and performs the rhythm sequence in usual duple using BAH and rhythm sticks.
The teacher and students chant and perform class patterns and individual patterns in usual duple using BAH and rhythm sticks.
The students are marked in the teaching mode and in the evaluation mode.

Criterion 1
1. Chant and perform the rhythm sequence in usual duple using BAH and rhythm sticks.
2. Explain to the class that you are going to chant and perform a rhythm pattern using BAH and rhythm sticks, and you want them to chant and perform the same rhythm pattern using BAH and rhythm sticks.
3. Using BAH and rhythm sticks, chant and perform a class pattern that is four macrobeats in length. Gesture to students when to breathe on the fourth macrobeat and then have them begin to chant and perform the pattern on BAH and rhythm sticks on the following macrobeat.
4. Continue with individual students following the same directions. When teaching individual patterns, be sure to do both the teaching mode (chanting and performing on rhythm sticks in duet with the individual student) and then the evaluation mode (the student chanting and performing on rhythm sticks solo). (Gordon, 2001, p. 120 – 121)

APPENDIX G

REVISED TEACHER APPROVAL / DISAPPROVAL FORM

Teacher Approval / Disapproval Form **[modified from Madsen & Madsen (1998)]**						
Observer:						
Lesson #:						
Treatment Group: 1 2 3 4						
Length of Observation Intervals: 10 seconds						
Length of Record Intervals: 10 seconds						
Length of Observed Lesson: 5 minutes (of a 10 minute lesson)						
Time	**(1)**	**2 – RECORD**	**(3)**	**4 – RECORD**	**(5)**	**6 – RECORD**
1	**OBSERVE NOW**	**As Aa Ds Da**	**OBSERVE NOW**	**As Aa Ds Da**	**OBSERVE NOW**	**As Aa Ds Da**
2		**As Aa Ds Da**		**As Aa Ds Da**		**As Aa Ds Da**
3		**As Aa Ds Da**		**As Aa Ds Da**		**As Aa Ds Da**
4		**As Aa Ds Da**		**As Aa Ds Da**		**As Aa Ds Da**
5		**As Aa Ds Da**		**As Aa Ds Da**		**As Aa Ds Da**

	Key:					
	As=	**Social Behavior Approval**		**Totals:**		
	Aa=	**Academic Behavior Approval**		**As_____**	**Ds_____**	
	Ds=	**Social Behavior Disapproval**		**Aa_____**	**Da_____**	
	Da=	**Academic Behavior Disapproval**				

APPENDIX H

IRB APPROVAL

THE UNIVERSITY of NORTH CAROLINA
GREENSBORO

OFFICE OF RESEARCH INTEGRITY
2718 Beverly Cooper Moore and Irene Mitchell Moore
Humanities and Research Administration Bldg.
PO Box 26170
Greensboro, NC 27402-6170
336.256.0253
Web site: www.uncg.edu/orc
Federalwide Assurance (FWA) #216

To: Karen Thomas
Music Education

From: UNCG IRB

Authorized signature on behalf of IRB

Approval Date: 6/15/2015
Expiration Date of Approval: 6/14/2016

RE: Notice of IRB Approval by Expedited Review (under 45 CFR 46.110)
Submission Type: Initial
Expedited Category: 7.Surveys/interviews/focus groups,6.Voice/image research recordings
Study #: 15-0281
Study Title: The Effect of Aural Instruction with Tonal and Rhythm Patterns from Edwin Gordon's Music Learning Theory on the Melodic and Rhythmic Discrimination Abilities of Second Grade Students

This submission has been approved by the IRB for the period indicated. It has been determined that the risk involved in this research is no more than minimal.

Study Description:

The primary purpose of this study is to investigate the effect of aural instruction with tonal and rhythm patterns from Edwin Gordon's Music Learning Theory on the melodic and rhythmic discrimination abilities of second grade students. Four intact second-grade general music classes will be randomly assigned to three experimental groups and one control group. The researcher, using pattern instruction for ten minutes each class period, will instruct the experimental groups. The control group will not receive pattern instruction. Participants will be administered the *Primary Measures of Music Audiation* (PMMA) as a pre-test and a post-test to measure their music aptitude and discrimination abilities. Participants will be administered a questionnaire to determine the extent of their musical experience and their music activity preferences.
Regulatory and other findings:

- This research, which involves children, meets criteria at 45 CFR 46.404 (research involving no greater than minimal risk). Permission of one parent or guardian is sufficient.

Investigator's Responsibilities

Federal regulations require that all research be reviewed at least annually. It is the Principal Investigator's responsibility to submit for renewal and obtain approval before the expiration date. You may not continue any research activity beyond the expiration date without IRB approval. Failure to receive approval for continuation before the expiration date will result in automatic termination of the approval for this study on the expiration date.

Signed letters, along with stamped copies of consent forms and other recruitment materials will be scanned to you in a separate email. **Stamped consent forms must be used unless the IRB has given you approval to waive this requirement.** Please notify the ORI office immediately if you have an issue with the stamped consents forms.

You are required to obtain IRB approval for any changes to any aspect of this study before they can be implemented (use the modification application available at http://integrity.uncg.edu/institutional-review-board/). Should any adverse event or unanticipated problem involving risks to subjects or others occur it must be reported immediately to the IRB using the "Unanticipated Problem-Adverse Event Form" at the same website. Please be aware that valid human subjects training and signed statements of confidentiality for all members of research team need to be kept on file with the lead investigator. Please note that you will also need to remain in compliance with the university "Access To and Retention of Research Data" Policy which can be found http://policy.uncg.edu/research_data/.

CC:
Constance McKoy, Music Education
Donald Hodges, Music Education

APPENDIX I

WINSTON-SALEM/FORSYTH COUNTY SCHOOLS

RESEARCH PROJECT APPROVAL

P.O. Box 2513 • Winston-Salem, NC 27102-2513

WS FCS

Project ID 2016-001

Approval Form for Research Project to be conducted in the Winston-Salem/Forsyth County Schools

Name of Principal Investigator: Karen Thomas

Advisor's Name (if student): Dr. C. McKoy & Dr. D. Hodges

Research/Educational Institution: UNCG

Research Title: the Effect of Aural Instruction with Tonal and Rhythm Patterns from Edwin Gordon's Music Learning theory on the Melodic and Rhythmic Discrimination Abilities of Second Grade Students.

The above project has been approved by the Winston-Salem/Forsyth County Schools Administrative Offices. Stipulations to this approval, if any, are noted below. *The investigator understands that the principals have the authority to grant or deny permission for the study to be conducted in their schools.*

Project Timeline: August, 2015 to December, 2016

Stipulations:

Data Confidentiality Form Needed? (Check if yes) :

Marty Ward, Ph.D.
WS/FCS Research & Evaluation

July 14, 2015
Date